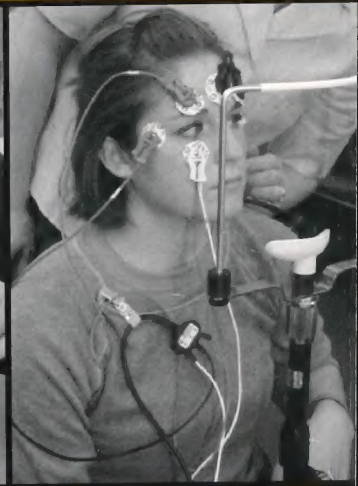


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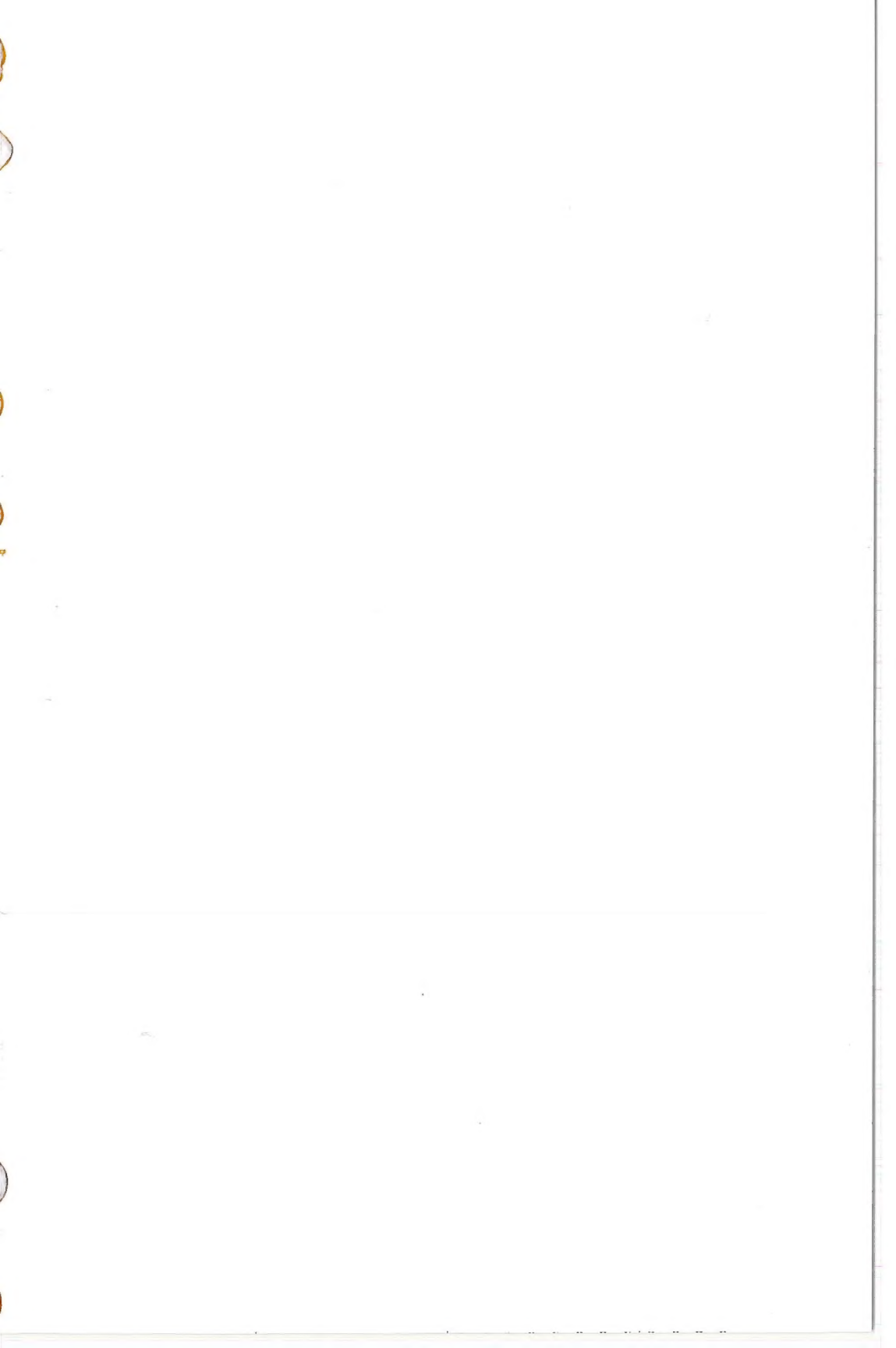
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Foreword

Welcome to the 8th edition of the *Journal of Student Research*, a University of Wisconsin-Stout publication that showcases exemplary student research and creative activities.

This journal is a prime example of Stout's commitment to student research and support of student-organized activities. Every stage of the production of this book—including cover design, printing and binding, writing, and editing—was completed entirely by Stout students. The journal you are now reading is a tribute to the hard work and commitment of our students, and their dedication and professionalism will speak for itself in the following pages.

The *Journal of Student Research* can be found in both print and online versions, allowing worldwide exposure that enables students to utilize their publication to benefit future personal and professional endeavors.

We would like to extend our appreciation to everyone involved in the production of the 8th edition of the *Journal of Student Research*. Without your hard work, dedication, and commitment to excellence, this journal would not have been possible.

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Caddisfly Larvae Visual System: Response to Light

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Keywords: Caddisfly Larvae, Insect Vision, Light Response

Abstract

Understanding the behavior the caddisfly larvae (Trichoptera, Integripalpia) can have implications in a variety of areas (i.e. the fishing industry) and issues surrounding environmental impacts. This study examines the caddisfly larvae's response to a controlled light stimulus. Experiments were completed in an environment designed to mimic the larvae's natural habitat while controlling the light exposure. During experiments, the majority of the animal's tank was kept completely dark with the exception of a narrow, defined light path which resulted in three different levels of light exposure within the tank. The caddisfly larvae's location and head orientation with respect to the three light levels were recorded. These experiments suggest that caddisfly larvae migrate to lighted areas and not towards darkness. Additionally, head orientation tends to be towards the lighted areas in the tank, similar to non-aquatic insects, but not overwhelmingly toward the source of the light. Furthermore, once in a lighted condition, either direct or ambient light, caddisfly larvae tend to stop moving and remain in the lighted condition.

Introduction

The larval caddisfly (Trichoptera, Integripalpia) is an aquatic insect species found in cool, freshwater and fast moving streams. The caddisfly larvae make up a large portion of the brook trout's diet, and thus their behaviors are of interest to anglers and the recreational fishing industry as a whole. In addition, the caddisfly larvae are used by environmental scientists to assess stream quality. Since the caddisfly larvae are intolerant of many pollutants, their survival within a stream is indication of a "good" stream rating on the WAV index chart (Morse, 1997). Thus, for a variety of reasons it is important to understand both the behavior and physiology of these insects. This paper examines the visual system of the caddisfly larvae, and more specifically, their behavioral response to light.

Literature Review

At present, limited information is available on the visual system of the larval caddisfly. Gilbert (1994) suggests they have light detecting stemmata rather than ocelli like many other larval invertebrates. In Lepidoptera, insects in the same phylogenetic superorder as the caddisfly, stemmata are capable of sophisticated vision and help to serve as guideposts for developing compound eyes (Morse, 1997). Indeed, studies on Lepidoptera indicate these animals respond positively to light and are attracted toward it, but have a "broad, but incomplete coverage of the environment" (Gilbert, 1994). Thus, they can detect light in their environment, but cannot distinguish details of their surroundings. A similar assessment of caddisfly vision has not yet been completed.

The caddisfly is a holometabolous insect, with the larvae living in freshwater habitats (Morse, 1997). The first larval instars start in the fall, remain dormant over winter, and continue their instar stages in the spring (Hart & Resh,

1980). Caddisfly larvae spend their larval stages either attached to local structures (e.g. rocks) or in motion, crawling or free-floating in the water. Activity seems to peak at mid-day and decreases thereafter (Galleg, 1975). Hart and Resh (1980) described the larvae as being more sedentary during the night than during the day, consistent with Galleg's (1975) results. They spend approximately two thirds of their lives filtering (feeding) and this seems to occur while the animal is attached to a structure (Hart & Resh, 1980). Galleg (1975) found that filtering occurs most frequently during hours of darkness, while all other activities, such as case-building, being withdrawn, moving, and free-floating, happen mostly during the day. These data may suggest that the animals are drawn to darkness where their feeding routine is carried out. This study examines whether these animals are specifically attracted to dark areas in their environment or if they prefer to be in a lighted environment. In contrast to the previous studies, which examined the animals behavior infrequently (only two times in a 24 hour period), this study examines the animals' behavior in the short-term, allowing for a more detailed description of the animal's response to light.

Method

Environmental Conditions

Larval caddisfly were studied in a laboratory environment under conditions meant to mimic their natural habitat. Specimens were obtained from a western Wisconsin stream (Elk Creek, Southern Branch) which has an average temperature of 61°F. Larvae were housed in a ten-gallon glass tank. Water temperature was maintained between 58° and 63°F and a current was induced by placing the bubbler and output hose of the water chiller unit at one end of the tank and the water pump/chiller intake hose at the opposite end of the tank. Various sized rocks, collected from Elk Creek,

were placed within the tank to provide natural attachment points for the caddisfly larvae. The larvae were nourished by adding crushed natural vegetation to the tank.

In order to study specific light responses of these animals, it was necessary to control the light level within the tank. Light was blocked from the sides and top of the tank with 2mm thick black panel board. Light entry through the bottom of the tank was eliminated by the use of a removable black fabric looped under and attached to the sides of the tank with Velcro. It was necessary for this lower panel to be removable in order to mark the location and orientation of the animals on the bottom surface (see Data Collection and Analysis). Finally, an additional black canopy tent was used to completely enclose the experiment along with the investigators during data collection. All light exposure experiments were done with the overhead room lights off and the investigator was completely dark-adapted for the course of the experiment. On one of the small faces of the tank, a 2.5 x 2.5 cm square was cut in the lower corner. This was the entry point for the controlled light exposure into the tank

Experimental Parameters

A full spectrum bulb (wavelength ~315nm-700nm) was used to replicate natural light during the data collection portion of the experiments. Light was shown through the square opening in the corner of the tank. The light source caused different areas of the tank to experience varying levels of light exposure as observed by looking down from the top opening. The different light levels were categorized as light path, ambient light and darkness. The light path consisted of the observed distinct beam of light along the bottom of the tank. Ambient light were those areas outside the distinct light path, but where general shapes could be distinguished by looking without the use of a flashlight. For example, if it

was possible to see a caddisfly larvae sitting on a rock out of the distinct path, the animal was considered as having an ambient light exposure. The transition between the light path and the ambient light was somewhat subjective, because the light path did not have a defined edge. In cases where an animal was on the border between these two areas, it was considered to be in ambient light. Darkness was defined as areas where shape could not be distinguished without the use of a flashlight.

The process for each experiment was as follows. First, in all but one experiment (light control, see below), the animals were placed in total darkness for 36-48 hours before data was collected (the cover was placed on top of the tank, the black sheet was placed under the tank, the canopy was draped over the experimental set-up and the overhead room lights were turned off). At the start of data collection, the light source was turned on. Immediately following, the caddisfly larvae were placed in specific locations within the tank. The locations were chosen for specific light exposure of the animals. Some animals were placed in the light path, others were placed in ambient light locations and still others were placed in the dark. The location, head orientation, and light exposure level of the animals were recorded every five minutes for approximately two hours. A flashlight was used briefly to locate the animals within the tank.

Two variations of the above parameters were used as controls. In the first, the light source was not turned on after the 36 hour dark period (dark control). The specimens remained in the dark during the entire two-hour data collection period, with the exception of when a flashlight was turned on briefly to observe their location and head orientation. This experiment indicated how the animals responded to strict darkness. In the second control experiment, the room lights, but not the full spectrum bulb, were turned on 41 hours be-

fore and during data collection (light control). The canopy did not cover the experimental set-up and the top and bottom covers for the tank were removed. Only the sides of the tank were kept covered. This experiment indicated how the animals respond in full light.

Data Collection and Analysis

To differentiate between caddisfly larvae, four specimens were marked by wrapping different colored orthodontic rubber bands around the outside of the larval case (orange, blue, yellow and green). If the rubber bands fell off in between experiments, a new specimen was chosen for marking. The bands did not appear to deform the case nor did they restrict the animals' mobility. Previous studies indicate that the immediate response of caddisfly larvae when handled is to withdraw into their case, but if little to no handling occurs, the behavior is close to that of unmarked larvae (Galleg, 1975). Even with marking, there is no significant difference in behavior (Hart & Resh, 1980). This also seemed to be the case in the study described here. The marked specimens seemed to move in a manner consistent with their unmarked counterparts. Attached to the bottom of the tank was a removable glass panel on which the location and head orientations of the animals were marked with a washable pen. The animals were observed by briefly removing the top panel and looking into the tank from above. A flashlight was used to provide brief, directed light in order to locate the animals in the tank for each observation. Furthermore, the light path, rocks, bubbler, pump and tubing were drawn in their relative locations. A single colored line, matching the color of the rubber band for a given specimen, was used to indicate the location of the animal. The direction of the line matched the angle of the caddisfly larva's case. Head orientation was indicated using a small perpendicular line at the head position.

The position and head orientation was recorded every five minutes. In addition to the markings on the glass panel, light exposure, whether or not the animal was moving, and the direction of that motion was recorded for each observation.

From the glass panel data it was possible to extrapolate overall motion with respect to both the light path and the light source. To do this, the observations for each animal were divided into trial blocks. A trial block included all observations between the time a specimen was placed in a specific location in the tank and the time the animal remained still for at least three observation periods (15 minutes). During the course of a normal experiment, each marked caddisfly larvae was placed in a specific location approximately 2-3 times. Subsets of data were obtained for each of these trial blocks, including light exposure and head orientation at the beginning and end of each trial block

Results

General Animal Behavior

Marking the animals with colored rubber bands did not seem to affect their mobility as compared to their unmarked counterparts, which is consistent with previous studies (Gallep, 1975; Hart & Resh, 1980). Thus, it is unlikely that marking the animals influenced the light response behavior. Furthermore, it is unlikely that the artificial environment in which the animals were observed influenced their natural tendencies. Indeed, Hart and Resh (1980) found that various factors of the physical stream parameters, such as turbidity or current, among others, do not affect behavior

Preferred Ending Locations

When free to move throughout their environment, caddisfly larvae tend to gravitate toward a lighted area over a short time period (Figure 1). Regardless of whether ani-

mals were initially placed in the dark, ambient light or direct light, generally within one hour the animals repositioned themselves so they were exposed to light. There is not a clear preference, however, for animals to locate in direct light as compared to ambient light.

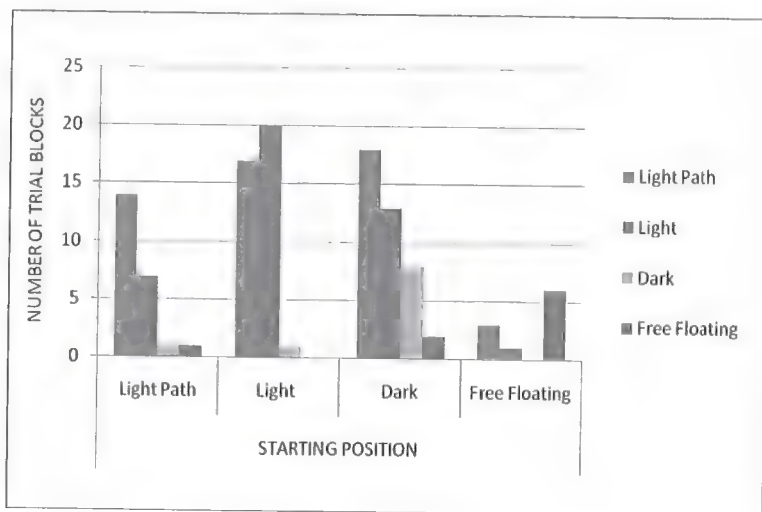


Figure 1. Starting and ending locations for total trial blocks. Different starting locations are shown on the horizontal axis. Ending locations are represented by the colored bar, as indicated in the legend. The vertical axis represents the number of trial blocks.

Of the 112 total trial blocks (all animals and experiments), 41 trial blocks (36.6%) started in the dark, 38 trial blocks (33.9%) started in ambient light, and 23 trial blocks (20.5%) started in direct light. There was a small collection of trial blocks (10 trial blocks, ~9%) where animals were not directly contacting a structure or the bottom of the tank and were either floating freely through the tank or attached to a structure via their silk and moving under the control of the current. These 10 trial blocks are included in Figure 1 but not

in the detailed analysis below.

When animals were placed in the dark, 75.6% of trial blocks ended in a lighted condition whereas only 19.5% ended in the dark. There was a small collection of animals placed in the dark that ended free floating (4.9%). While the animals shifted their position towards a lighted condition, there was only a minimal preference specifically toward direct light as compared to ambient light (43.9% vs. 31.7%, respectively). When animals were placed in ambient light, they tended to either remain where they were initially placed (52.6%) or shift to direct light (44.7%). Only 2.6% of trials resulted in the animals shifting towards darkness. A similar result occurred when animals began in direct light. Although most (60.9%) of the trial blocks resulted in the animals staying within direct light, in 30.4% of the trial blocks the animals shifted towards ambient light, and in only 4.3% (1 of 23 trial blocks) did an animal move from direct light to darkness. Taken together, these data suggest that the caddisfly larvae have a strong tendency to position themselves in a lighted area over a short time period. However, there does not seem to be a strong tendency for these animals to be located in direct light, but rather direct or ambient light is sufficient. Furthermore, the caddisfly larvae do not gravitate towards darkness.

Head Orientation Behaviors

Since the caddisfly larvae prefer to be in a lighted environment, it might be expected that animals would orientate their heads towards the light path or the light source. Since the stemmata are located lateral on the head, the caddisfly larvae may also orientate their head parallel to the light path or light source. When the animals were in the dark, their heads were orientated towards or parallel to the light path in 75.3% of observations (Table 1). Animals in ambient light

showed a tendency to orientate towards or parallel to the light path in 67.3% of observations. Since animals located within the light path are, by default, orientated toward the path, they were not considered in this analysis.

Table 1
Caddisfly Head Orientation Relative to Light Path

	Towards/Parallel to Light Path	Away from Light Path
Animals in Darkness	75.3%	24.7%
Animals in Ambient Light	67.3%	32.7%
OVERALL	71.3%	28.7%

In addition to orientation towards the light path, the orientation towards the light source was also examined for each observation, including those where the animal was located within the light path (Table 2). Animals in the dark orientated specifically towards or parallel to the light source in 72.6% of observations. When animals were in ambient light, they orientated towards or parallel to the light source in just over half of the observations (55.2%). Similarly, when animals were within the light path, they again orientated towards or parallel to the light source in nearly half of the observations (44.7%).

Table 2
Caddisfly Head Orientation Relative to Light Source

	Towards Light Source	Away from Light Source
Animals in Darkness	72.6%	27.4%
Animals in Ambient Light	55.2%	44.8%
Animals in Light Path	44.7%	55.3%
OVERALL	57.5%	42.5%

Taken together, these data suggest that while the animals position themselves so they are orientated toward the light path, they show only a slight preference towards the source of that light, particularly when they are already in a lighted area.

Observed Movements

For some of the observations (70 of 798), the specimen was moving during the observation time. In these situations, the direction of motion was recorded with respect to the light path and the light source (Tables 3 & 4).

Light Path: Only observations while the animals were located outside the light path were considered (49 of 70). A large majority (91.4%) of these observations showed motion towards the light path (Table 3). Of these 49 observations, 14 were of animals located in the dark and all these animals showed movement towards the light path. Of the remaining 35 animals, which were located in ambient light, 91.4% showed motion toward the light path.

Table 3
Caddisfly Movement Relative to Light Path

	Towards/Parallel to Light Path	Away from Light Path
Animals in Darkness	100%	0%
Animals in Ambient Light	91.4%	8.6%
OVERALL	95.7%	4.3%

Light Source: All 70 observations where motion occurred during the recording were assessed to determine the direction of motion relative to the light source (the small 2.5 x 2.5 cm square at the corner of the tank; Table 4). Larvae located in the dark moved towards the light source in 75.0% of trials. Specimens in ambient light moved towards the light

source 72.7% of the time. Finally, the animals within the light path moved 61.9% of the time toward the light source. These data suggest the animals do show a slight tendency for motion towards the light source.

Table 4
Caddisfly Movement Relative to Light Source

	Towards Light Source	Away from Light Source
Animals in Darkness	75%	25%
Animals in Ambient Light	72.7%	27.3%
Animals in Light Path	61.9%	38.1%
OVERALL	69.9%	30.1%

Taken together, the motion data is consistent with the location data presented previously, such that the animals prefer to locate in light areas. Although Table 4 suggests that the animals have a preference to move towards the light source, since the light source is within the light path, it is difficult to distinguish between these two.

Control Experiments

Darkness: When animals were placed in complete darkness, their behavior did not follow a specific pattern. For example, one specimen orientated its head in a variety of directions with very little translational movement. Another specimen remained orientated in one direction with linear movement but, when relocated, orientated in a variety of directions with little movement. The last specimen remained free-floating for the majority of the experiment. These data suggest that when the insects are in complete darkness, they do not orientate their heads or move in a distinguishable pattern.

Complete Light: The overall behavior of animals in total light is much more sedentary, with only 7 changes in location per animal during the entire 2 hour experiment.

This is in contrast with the roughly 14-21 location changes per animal that occurred during the light exposure experiments. This limited movement in a lighted environment is consistent with the suggestion that once animals are within a lighted environment, they tend to remain stationary.

Discussion

Caddisfly larvae prefer exposure to light (Figure 1). When specimens are placed in darkness, they gravitate to either direct or ambient light. When the specimens are placed in either the direct light or ambient light, they tend to remain in a lighted condition either by staying in their current light exposure or moving between the two types of light exposure. Given that the animals relocate themselves in both direct light and ambient light with similar frequency, there does not seem to be a preference for one light condition over the other. For all three starting conditions, the animals did not tend to remain in or gravitate toward darkness (only 2 of 61 trials starting in either direct light or ambient light moved to darkness and in only 8 of 41 trials starting in darkness the animals remained in darkness).

While the animals did not seem to gravitate differentially toward direct light as compared to ambient light, they did orientate their heads toward the light path (Table 1), but not necessarily toward the light source (Table 2). Similarly, when animals were moving during the observations, they seemed to move towards or parallel to the light path (Table 3), and with a slight preference toward the light source (Table 4). However, since the light source is within the light path, it is difficult to determine whether the preference was toward the source specifically.

If the animals gravitate towards lighted areas (direct and ambient) but not specifically towards the direct light (and thus the light path), then why is there a slight tendency for

both their head orientation and observed movements to be toward the light path? It is possible that the physical size of the aquarium limited the animals' ability to differentiate between direct light and ambient light, particularly since there was not a clear distinction between these two adjacent areas in the tank. Even with this possibility, a strong tendency for these animals to position themselves in a lighted area is evident.

While it appears to be common knowledge that non-aquatic insects gravitate toward light, prior to this study, little has been known about aquatic insects' response to light. Further, as the first of its kind, this paper describes a methodology that is effective for studying specific short-term light responses in aquatic insects. Knowing whether or not an aquatic insect gravitates toward light might aid environmental scientists and others in various pursuits. For example, by artificially controlling the light exposure within the stream, it may be possible to manipulate where a specific aquatic insect locates. Further, knowing valuable information about the caddisfly larvae will aid researchers examining behaviors of brook trout in a stream, since during feeding times, brook trout may tend to mimic behaviors of the caddisfly larvae.

This study describes the first examination of the visual system in the caddisfly larvae. It will be valuable to expand these ideas and techniques to look at more complex visual processing such as the threshold of light detection and color distinguishing capabilities. One might expect minimal color capabilities since stemmata serve as guideposts for the more sophisticated compound eye in phylogenetic orders such as Lepidoptera, and it has been shown that even the larvae of Lepidoptera have "green sensitive photoreceptors" (Gilbert, 1994). Even though the stemmata are only light and dark detectors, there could be other factors involved which cause

a preference towards a particular wavelength, and thus color, of light.

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Gift Giving Characteristics of Recipients and Function of Gifting Anxieties

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Keywords: Gift Giving, Social Anxiety, Electrodermal Activity, Reaction Time

Abstract

Previous research suggests that gift giving is a form of identity presentation that enables givers to create a desired image of themselves for gift recipients. Sometimes, however, individuals experience anxiety when selecting gifts that best reflect this desired identity (Sherry et al., 1993). Furthermore, the influential power of the gift receiver can create mental stress for the giver. This stress may be reflected in greater physiological arousal and longer decision making time. The purpose of this study was to demonstrate physiologically the anxiety caused by gift giving to influential gift recipients. The results showed that the difficult recipient group registered the highest gifting anxiety as measured by electrodermal response. However, the amount of time spent making gift purchasing decisions was not influenced by either types of recipients or emotional importance. Within the category of difficult recipients, in-laws created the most stress on givers, whereas children and same-gender friends produced the least stress.

Introduction

Gift giving is a universal social norm of human culture, and has been discussed from a theoretical perspective focusing on the functions and effects of giving (Belk, 1976). Previous research has found that not only do gifts help maintain our social ties, but also create and worsen interpersonal conflict. Gift giving anxiety is the givers' fear of being negatively evaluated by the recipients. This is part of social anxiety, similar to other anxieties such as test taking and public speaking (Leary & Kowalski, 1995). A few researchers have investigated this issue using qualitative research, however, no study to date has randomly assigned participants to be hypothetical gift shoppers and examined their physiological responses. Therefore, further research should be done to more accurately understand gift giving anxiety, including the measures of physiological responses.

Although there are many gift giving motivators, many gift givers wish to have a positive influence on recipients by presenting them with gifts they perceive as favorable while avoiding gifting perceived as being negative. Since gift recipient feedback emotionally affects the giver, the greater the influence the recipient has on the giver and the more difficult it is to satisfy him or her, the more anxiety the giver will feel about selecting gifts. In addition, givers use gifts to establish or maintain a positive impression with the recipient. For this reason, givers usually spend more time carefully selecting gifts for recipients who are influential and powerful as well as when the giver desires the recipient's approval.

The act of giving gifts can create mental stress by requiring an examination of the standards of propriety and negotiation of identity, which can produce inauthentic versions of the self, and subsequently, stress. In spite of advanced investigation of other forms of social anxiety existence, psychologists have not considered gift giving to be a salient re-

search topic. Gift giving anxiety is a serious social phenomenon and deserves more attention by psychologists.

Literature Review

Gift giving is a central part of our behavior and culture as humans (Mysterud, Drevon, & Slagsvold, 2006). It has a great impact in maintaining social ties and serves as means of symbolic communication in social relationships (Ruth, Otnes, & Brunel, 1999). However, there may also be negative effects.

Power of Giving: Norm of Reciprocity

Throughout the gift giving process, individuals contribute to the general welfare of recipients, they hope to repay/receive something based on past generosity (Lampel & Bhalla, 2007), or expect to reap future generosity. Gift giving may create the obligation to reciprocate, which led Gouldner (1960) to classify the gift giving system as a norm of reciprocity. This is a mechanism to start and maintain a stable societal system by creating interdependency and strong relationships (Gouldner, 1960). Gift exchange plays an important role in the development and stability of society and culture (Lévi-Strauss, 1949/1969; Sahlins, 1972, as noted in Komter, 1997, p.747). Excluding pure gifts, where nothing is expected in return (Komter, 1997), givers expect some type of benefit from the gift giving activity. The benefits are directly related to the giver's personal intentions, which may include receipt of a gift from the recipient, the maintenance and/or improvement of a relationship, or the establishment of the giver's superiority. This social norm is so important that it may produce gift anxiety. Norms exist for people to follow, and if violated, it may result in individuals being directly punished by others and made to feel guilt, shame, embarrassment, anxiety, or some other negative

feelings (Basu, 2001).

The Gift as Identity Builder

Another reason this social norm creates mental stress is that gifts may necessitate a negotiation of identity (Sherry, McGrath, & Levy, 1993). Gifts provide recipients with images that help build a giver's identity. Gifts represent the giver's feelings toward recipients and gift giving behavior is derived from a giver's perceptions of others. Cooley (1902, as cited in Schwartz, 1967) called gifts "ideas of others", suggesting that gifting is a way of free associating about the recipient in the absence of self and others.

Givers also exhibit social roles through gift giving. Social roles refer to sets of behaviors that individuals adopt within a group and are expected to perform during the gift exchange (Baron & Byrne, 2000). Individuals perform different roles in the groups to which they belong. The type and level of social roles of givers may affect their giving behavior differently. Throughout one's life, a person plays several social roles. This collection of diverse social roles is called social identity. Social identity is a self-definition of how one conceptualizes and evaluates his or herself. It is one of the factors influencing gift giving behavior.

Attention and Impression Management Theories

Gift giving expresses one's feelings to others. It also calls attention to a giver's choice in selecting gifts relative to appropriate style and occasion as well as serves as a self-display of her or his generosity to others. To exchange of attention is an essential pleasure in our social life (Derber, 2000). Getting attention helps to satisfy fundamental human needs from respect to self-esteem. In today's society, more individuals are seeking attention for themselves. This pattern seems particularly strong in individualistic cultures like

that of the United States. Some gifting exchanges are used for getting attention while others are used to give attention to others. The choice of actions is influenced by one's personality, social role (e.g. gender, professional role,) economic, and political power. For example, occupational roles such as a social worker or nurse are more attention-giving types while a movie actor or fashion model is more attention-getting. Gift exchange satisfies both attention-getting and attention-giving needs.

Effectively getting or giving expected attention is an aspect of good impression management. According to Sherry (1983, p.164), gift giving requires "preparation of the gift and self in the service of impression management." People go through this in their attempt to control the impression other people construct of them. It is also defined as self-representation, which refers to the activities used to influence the perception one has of her or his image. Since a first impression is very important for one's future relationships with individuals and organizations, gift givers undertake a variety of efforts to establish and maintain a desirable recipient impression. Their efforts often become transparent under the pressure of satisfying recipients' demands and desires. Concerned about how their gifts will be interpreted, they may even feel a lack of control over those interpretations which triggers social anxiety (Wooten, 2000). As a result, gifts have the power to control one's emotions, attitudes, or behavior. For example, givers may feel the need to devote more attention and time to the selection of a gift for someone who is identified as being difficult to satisfy.

There has been discussion regarding whether or not reaction time (time to respond to each question) truly reflects "thinking time" needed for completing a task. Reaction time can be related to the time needed for thinking (premotor time) or for some secondary variable to indicate the response, such

as the actual time needed to move one's hand to make the response (motor time). Halpern (2000) concluded that the longer the mean reaction time, the more cognitive abilities used. Simply put, longer reaction time may indicate more mental involvement on the part of givers.

Social Influence through Gift Giving

People have power to influence others. The power to influence individuals to change their attitude, beliefs, perceptions or behaviors is called social influence (Cialdini, 1994, as cited in Baron & Byrne, 2000). People subconsciously use social influence in the gift giving process.

Wooten (2000) introduced social influence as an anxiety factor that relates to a relationship between the giver and receiver. The giver's desire is to have a positive influence on recipients by presenting appropriate gifts and avoid a negative reaction from recipients. Fear associated with actually presenting or imagining presenting a gift occurs when givers recognize recipients as "influential" and "important" persons in their personal life including romantic partners, close friends, favorite relatives, and in-laws. These recipients' feedback is more likely to affect givers' emotions.

Otnes et al. (1993) explored the meaning of easy or difficult recipients from the giver's view in terms of gift selection. The informants of their study labeled their gift recipients as being easy or difficult. Easy recipients were described as those who had correctly interpreted the message in the gift exchange and offered little resistance as givers tried to express a specific social role such as the giver's relationship with children and same-gender friends. On the other hand, difficult recipients tend to misinterpret gifts designed to express specific social roles and are likely to misread a giver's attempt to express a particular role through gift exchange regardless of the giver's conscious or unconscious

intentions. Difficult recipients also tend to be older or more distant relatives.

Gift Message and Emotional Significance

As previously described, when giving gifts, givers take various factors into consideration such as norm of reciprocity, their relationship with recipients, social role/identity of givers/recipients, and influential power that recipients have toward givers. Because gift giving influences the relationship between giver and recipient, the giver's emotions toward the recipient make a difference to the giver's decision-making process. Therefore, gifts may or may not correctly reflect givers' intentions. For the gift giving to be a successful event, receivers are challenged to correctly interpret the meaning. Although the giver does her/his best to attach personal meaning to the gift, it does not always result in a successful interpretation because receivers may possess their own assumptions about gift occasions, gift intent, and the social meaning of objects (Sunwolf, 2006).

The emotions of the giver toward the recipient play an important role in gift giving. No matter if it is positive or negative, closeness that the giver feels to the recipient may affect selection of the gift, selecting time spent, and giver's anxiety while selecting and giving. Malinowski and Sahlins's idea, as discussed in Komter and Vollebergh (1997, p. 747), describes an association between the closeness of social relationships and the purity of the gift. They acknowledged the difference between pure/altruistic gifts (give something for nothing) and obligatory gifts (derived from the norm of reciprocity), and then empathized that the greater the emotional distance, the less pure the connected feelings of being disinterested, sympathy or involvement, and the stronger the feelings of reciprocal obligations and quid pro quo. In addition, Komter and Vollebergh (1997) found that gift giving

to friends more frequently occurs with feelings of affection while gift giving to primary family members is accompanied by both feelings of affection and moral obligation. As the gift may carry the giver's message, emotional closeness can be one of the major causes of gifting anxiety.

Social Anxiety in Gift Giving

Schlenker and Leary (1982) indicated that social anxiety arises when people are motivated to make a positive impression on real or imagined audiences but doubt they will do so. The closer the relationship between the giver and the recipient and the more difficult the recipients are, the more anxiety givers feel about selecting gifts. Frustrated givers often blame difficult recipients who are hard to satisfy (e.g. picky ones) or hard to accurately determine their gift preferences (e.g. unfamiliar ones). They are difficult because they prevent givers' attempts to enact desired social roles (Otnes et al, 1992, as cited in Wooten, 2000). Thus, an unfavorable reaction by a recipient may humiliate not only the gift itself but also the giver.

Sherry et al. (1993, p. 229) showed that many of their respondents felt a strong pressure to "do the right thing" within gift giving situations. They also found that the wrong gift could be read as an "unfortunate mistake" but still "long remembered." The wrong gift can be a "waste, which disappoints, frustrates, annoys, upsets, embarrasses, hurts, and disheartens." Moreover, it is "thoughtless, impersonal, useless or inexcusable." Even worse, "it makes me feel unknown or does not contain caring." On the whole, gifting anxiety can be categorized as social anxiety just like other forms of anxiety such as test and competition anxiety (Leary & Kowalski, 1995, as cited in Wooten, 2000).

Physical Responses Caused by Social Anxiety

Social anxiety refers to an excessive concern about the prospect of being negatively evaluated by others (Schlenker & Leary, 1982, as cited in Wooten, 2000). Recognized social anxiety for the general public includes stage fright and audience anxiety, public speaking anxiety, and competition anxiety. People who feel socially anxious show clear evidence of sympathetic arousal. Episodes of social anxiety are associated with increased heart rate, respiration, galvanic skin response, blood pressure and decreased hand temperature (Houtman & Bakker, 1991). A person who arouses physiologically but who does not think worrisome thoughts would be characterized as agitated, aroused, or discombobulated, but not as anxious (Frijda, 1986). When anxious, people think about the source of their fear, such as interacting with one's boss, taking tests, or speaking in public. Whichever dominates a person's thoughts at a given time, these irritating cognitions may burden the anxious individual's attentional capacity. Switching attention away from task-relevant information preoccupies her or his mind and causes self-presentational difficulties (Hamilton, 1975).

Gift giving plays a role in status continuation and locomotion. Regardless of its importance, the difficulties that gift givers feel tend to be overlooked. The fact is that many givers face dilemmas which create fears of being evaluated, choosing a wrong gift, or being misinterpreted. This study attempts to demonstrate gifting anxiety not only psychologically but also at a physiological level. Therefore, this study will examine gift giving anxiety by measuring changes in physiological skin responses and duration of time spent selecting gifts.

The hypotheses of the present study were:

1. The givers with difficult recipients in a strong emotional importance setting will display higher states of anxiety than

those with easy recipients in a weak emotional importance setting.

2. The givers with difficult recipients in a strong emotional importance setting will take longer to select a gift than those with easy recipients in a weak emotional importance setting.

Method

Participants

Participants were $N = 70$ undergraduate and graduate students from the University of Wisconsin-Stout (18 males, mean age = 21 years, 45 females, mean age = 22 years). Research participants were recruited from three undergraduate/graduate courses with some receiving course credit for their involvement.

Data from seven of the respondents was excluded because two of them did not have souvenir purchasing experience, one ignored the instructions, two provided data that was invalid, one had to retake the experiment three times due to her lack of understanding of the instructions, and one became extremely agitated and her physiological response was exaggerated to an abnormal, unusable level.

Research participants were randomly assigned to one of two imagined gift recipient groups: easy recipients or difficult recipients. Participants had a choice to pick one specific person in their life from the recipient lists so that they could easily relate to the actual existing person. If they did not have one of these people in their life, they were asked to imagine having a pretend recipient from these recipient options.

Materials

Gifting Instrument. Twenty-three stimuli were presented in this experiment. These stimuli were photographs of gifts from Florida that were found on the internet. In order to manipulate situations/rituals of gift giving (Christmas, birthday, etc.), selected gifts were limited to souvenirs only. Most gift items were neutral, appropriate for all ages and genders. Some gifts were more oriented for older ages, some were more for children, and some were more gender specific. Relative to price, a statement was included in the questionnaire indicating that the cost of all displayed gift items was similar. A sample of gift images is shown in Figure 1.



How likely would you choose this gift for the person?

1. Definitely would not choose
2. Might not choose
3. Might choose
4. Definitely would choose

Figure 1. A sample of stimuli and a rating question presented

The actual gift images were presented on a computer monitor, and were approximately 3.15-in. (0.08 m) \times 3.9-in (0.09 m). Along with each stimulus, a 4-point Likert scale was presented ranging from 1 ("Definitely would not choose") to 4 ("Definitely would choose") (see Figure 1). Although the rating scale was used for the participant to rate the gift images, this study did not intend to analyze the rating scale results. Instead, the purpose of using the rating scale was to allow the participant to imagine shopping for a gift for the recipient so that electrodermal activity (EDA) and reaction time (RT) could be measured. Using those stimuli and the rating scale, the researcher created a stimulus presenta-

tion in SuperLabTM 4.0, which is software used for building experiments, implementing them, and collecting data. It is useful software for presenting visual stimuli on a computerized screen.

Demographic Questionnaire. Participants completed a three-item demographic questionnaire pertaining to their gender, age, and ethnicity.

Experimental Questions. Participants were asked if they had a souvenir purchasing experience prior to the experiment. After rating all gifts, they were asked to rate the difficulty of selecting an appropriate gift for their imagined recipient. Participants were then asked to indicate their real or imaged emotional closeness to the selected recipient.

Electrodermal Activity measures (EDA). EDA was recorded as a measure of autonomic arousal in response to stress. It is a measure of a change in skin conductance resulting from endocrine sweat gland activity, which is modulated by states of emotional stress (Lim, Edis, Kranz, Mendelson, Selwood, & Scott, 1983). EDA was recorded using a BiopacTM MP30 recording system (BiopacSystems, Inc., n.d.). The device measured small changes in electrical conductance across the skin using a noninvasive procedure. EDA was measured in the electrical conductance unit μmho , which is .000001 times the unit mho and the direct, reciprocal of the standard electrical resistance unit μohm . There is no harm to participants in this process of measuring EDA (Cacioppo, Tassinary, & Berntson, 2007). EDA was measured while the participant rated 23 stimuli (gift images). In those 23 stimuli presentation, the participant was asked to wait seeing the instruction: "Please wait..." for 6 seconds. This 6-second inter-trial period before going to the next rating question allowed the participant enough time for the level of EDA to return to baseline.

Reaction Time measures (RT). Reaction time is measured in thousandths of a second or milliseconds (ms). It may take 100 ms to withdraw our hand from the stove and 500 ms to read out loud a number printed on a piece of paper. The difference in reaction time occurs due to the different amount of time it takes for the central nervous system to process the sensory signals and to choose the appropriate course of action (Rothwell, n.d.).

In this experiment, reaction time was measured from the point where a stimulus was presented until the moment where the participant inputted the answer (see Figure 2) as duration of time in selecting a gift. The BIOPACTM STP100 is a device to measure the participant's responses to stimuli including reaction time. Participants were asked to manually press a keyboard as soon as they were ready to rate each stimulus. Then, the synchronization signals from the STP 100 directly went to the MP30 running on a first computer. A second computer where the SuperLab software and a Digital I/O card were placed received the signals for data synchronization and collection purposes (Biopac Systems, Inc., n.d.).

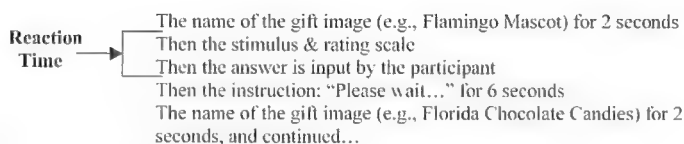


Figure 2. Recorded Reaction Time

Design and Procedure

This study was a 2×2 between-subjects factorial design with independent variables being the level of difficulty of the gift recipient (easy or difficult) and emotional importance that the gift givers felt toward these recipients (close or

not close). Respondents rated emotion toward the imagined recipients on a 4-point Likert scale: 1 = not close at all, 2 = not close, 3 = close, and 4 = very close. The dependent variable in the experiment was anxiety (EDA) and duration of time in selecting a gift (RT).

Participants were randomly assigned to one of two conditions, easy or difficult, before they entered the experimental room. Each participant, with finger electrodes attached, was seated in a chair in a quiet room at normal ambient temperatures and instructed to look at the monitor situated in front of them. Participants began to read the written instructions. In the condition they were assigned, they were asked to pick one specific person in their life from the recipient options or to imagine having a pretend recipient. After they picked one specific person, they saw the questionnaire instructions and were asked to read a story on the next page. In both condition groups they were given a common scenario which asked them to imagine a situation of choosing a gift for a recipient. The questionnaire instructions told them to imagine they were on vacation at San Pompano Beach, Florida (which does not exist but was made up by the researcher in order to manipulate participants' travel/shopping experience.) They then envisioned themselves being at a local gift shop and buying a gift for the person they had just picked. The name of the gift came up on the screen for 2 seconds. Then a picture of the gift along with the rating question appeared. As an imagined gift giver, the task was to rate how likely she or he would select each gift for her or his imagined recipient. After rating each gift, the participant was asked to wait for 6 seconds by seeing an instruction: "Please wait..." After rating all gifts, participants were asked to rate the difficulty of selecting an appropriate gift for their imagined recipient. Participants were then asked to indicate their real or imaged emotional closeness to the selected recipient.

For the final research activity, they filled out a computer-based questionnaire which included demographic information (age, gender, and ethnicity). After indicating their choices, the instructions told the participant to let the researcher know that they were finished with the experiment. In the end the participants was debriefed orally, given a printed debriefing form, thanked and dismissed.

Results

Data Analysis

The collected data, which included participants' answer choices, electrodermal Activity (EDA) and reaction time (RT), was saved in a text-only file and exported to an Excel spreadsheet. The data was then converted into a Statistical Package for the Social Sciences (SPSS 15.1) format.

RT and EDA were analyzed to see if they were influenced by the types of recipients, easy recipient (child or same-gender friend) and difficult recipient (grandparent/elderly relative or in-law) from Otne et al.'s (1993) study. Participants in this study were asked to answer the question, "How easy or difficult was it to think about buying a gift for the person?" The answers were measured by RT and EDA. Next, more detail analyses were conducted on the recipient groups, each type of recipients, emotional significance groups, and every level of emotion significance.

Preliminary Analysis of Reaction Time and Electrodermal Activity Measures

Respondents who virtually purchased a gift for a recipient who they were emotionally close to were selected prior to the analysis. An independent samples t-test was then used to investigate whether the hypotheses were correct (Table 1). No difference of RT was found in the difficult recipient with a strong emotion, however as hypothesized the

respondents who shopped for the difficult recipients with a strong emotion ($M = .3469$, $SD = .297$, $p = .042$) showed a greater mean EDA μmho change than those who purchased for the easy recipients with a weak emotion ($M = .1972$, $SD = .17808$, $p = .049$) at the .05 level.

Table 1
Reaction Time and Electrodermal Activity by Easy/Difficult Recipients of a Strong/Weak Emotion

	Recipient type	Mean	Standard Deviation	<i>t</i>	<i>df</i>	<i>p</i>
Reaction Time	Easy recipients with a weak emotion	2290.84	625.35			
	Difficult recipients with a strong emotion	2125.65	468.70	1.07	47.30	.30
Electrodermal Activity	Easy recipients with a weak emotion	.20	.18			
	Difficult recipients of a strong emotion	.35	.30	-2.12	34.80	.04

Note: *t* = *t*-value; *df* = degrees of freedom; *p* = *p*-value

Descriptive Statistics for RT and EDA by Easy/Difficult Recipients

An independent samples *t*-test was used to see if there were mean differences of RT and EDA between easy recipient and difficult recipient groups. There was no difference between the recipient groups in RT. However as hypothesized, the type of recipient groups significantly influenced mean EDA μmho changes, $t = -3.336$, $df = 41.69$, $p = .002$. Respondents who virtually selected gifts for difficult recipients ($M = .423$, $SD = .380$) were more likely to show higher levels of EDA than those with easy recipients ($M = .194$, $SD = .169$).

RT and EDA by Each Recipient

A one-way ANOVA was analyzed to determine differences of RT and EDA by types of gift recipients. Although no difference of RT was found in recipient groups, there was a statistically significant difference of mean EDA μ mho change in recipient groups, $F(3, 60) = 5.736, p = .002$. Since the significant difference was found by the one-way ANOVA, a Tukey HSD post-hoc test was revealed to see where the differences were. The significant difference was found in comparing two pairs: child and in-law and same-gender friend and in-law. The mean EDA μ mho difference between child and in-law was .515, and same-gender friend and in-law was .529.

Descriptive Statistics for RT and EDA by Emotional Importance

Respondents rated emotion toward the imagined recipients on a 4-point Likert scale ranging from 1 (not close at all) to 4 (very close). The respondents' answers were classified into two levels of closeness. Very close and close were combined into close, whereas not close and not close at all were combined into not close. Of 51 in the close group, 20 selected close and 31 selected very close. No respondents selected not close at all.

An independent samples t-test revealed that there was a statistically significant mean EDA μ mho change between close and not close groups, $t(62) = 2.416, p = .016$. The respondents who used their imagination to purchase a gift for a recipient who they were close to were more likely to show higher states of anxiety than those who were not close to the recipients.

RT and EDA by Each Emotion

A one-way ANOVA was conducted to determine differences of RT and EDA by every level of emotional significance of respondents to the recipient. Although no difference of RT was found in the closeness group, there was a statistically significant difference of EDA in closeness group, $F(2, 61) = 3.416, p = .016$. Since the significant mean EDA μ change was found by the one-way ANOVA, a Tukey HSD post-hoc test was revealed to see where the differences were. The significant difference was found in comparing not close and close group and the mean difference between those groups was .262. Contrary to expectation, the respondents who used their imagination to purchase a gift for a recipient who they were very close to were less likely to feel anxiety than those who were not close to their proposed recipients.

RT and EDA by Level of Difficulty When Imagining Recipient

The respondents were asked, "How easy or difficult was it to think about buying a gift for the person?" Their answers were rated on the 4-point Likert scale (1 = very difficult, 2 = difficult, 3 = easy, 4 = very easy). Frequency distribution of the results was as follows. Nearly half of the respondents said it was difficult to think about purchasing a gift for the imagined recipient ($n = 34, 48.6\%$). The next largest group was very difficult ($n = 20, 29.9\%$). The rest of the respondents said it was easy ($n = 13, 18.6\%$). Interestingly, of 67 respondents, none of them said it was very easy.

A one-way ANOVA was conducted to see whether there was a difference in RT and EDA between levels of difficult recipients, but no significant difference was found.

Discussion

The literature review demonstrated that major functions of the gift exchange process contribute to individuals in society in both negative and positive ways. Only a few studies conducted in the past have discussed the negative side of gift exchange. This study investigated a physiological measure of a gift giver's anxiety which the researchers recognize as a negative aspect of gift giving. As a primary consideration, four types of recipients were used to manipulate this experiment. These recipients included children, same-gender friends, grandparents/elderly relatives, and in-laws. The two former were categorized as easy recipients and the latter two were labeled as difficult recipients, which is based on the Otnes et al. (1993) study.

Using a stimulus presentation and questionnaire, anxiety levels of the respondents were measured when selecting gifts. The respondents who virtually selected gifts for difficult recipients who were emotionally close to the recipient were more likely to feel anxious than those who shopped for easy recipients. Therefore, one of the hypotheses was confirmed. However, their virtual shopping time was not affected by the giver's levels of difficulty or emotional importance toward the recipients, which concluded that the second hypothesis was rejected. The participants' shopping experience was only in their imagination. No decision-making was needed for the participants about the gift's monetary value. Although all five senses (touch, sight, sound, smell, and taste) might be the important factors to attract customers' shopping experiences (Kim, 2002), the present research limited the participants to only use their visual sense for a purchasing decision. Therefore, there could not be an appropriate setting to measure their virtual shopping time.

Although Otnes et al.'s (1993) study and this study have different sample populations, such as their age and gift

giving experiences, respondents in both studies were similar in their agreement with who was easy and who was not, in terms of gift selection.

When looking at RT and EDA by easy and difficult recipients, and by emotional importance, the respondents who rated gifts for difficult recipients tended to show higher states of anxiety as well as those who shopped for emotionally not close recipients. The emotional stress demonstrated their physiological anxiety level.

In a detailed analysis of each recipient, in-law was the most anxiety provoking gift recipient of the four types of recipients studied. Moreover, there was a great difference when comparing the in-law group to the child and same-gender friend groups respectively. Once again, the typical characteristic of difficult recipients was that this group tended to misinterpret gifts. They are likely to misread a giver's attempt to express a particular role through gift exchange regardless of his/her conscious or unconscious intentions (Otnes et al., 1993). In general, interpersonal relationships and social roles among family members are good predictors of family satisfaction and their emotional stress (Weigel & Weigel, 1990). Santos and Levitt (2007) identified in-laws as often causing strong emotional stress to their families. As for emotional importance, the respondents who selected gifts in their imagination for an emotionally close recipient showed higher levels of anxiety than those without close recipients.

Conclusions

A gift helps us to communicate our identity, express our feelings, and maintain our social relationships. Gift giving is a human social norm that every culture has, which plays an important role in keeping the society running more efficiently.

Givers aim to handle this significant norm well which often causes them emotional stress. Gift giving anxiety is an accepted topic of study among marketers, sociologists, and anthropologists. It was my desire to consider this issue from a physiological and psychological point of view and to show that many givers are literally stressed by this norm.

The purpose of this study was to examine gift giving anxiety by measuring changes in physiological skin responses and duration of time spent selecting gifts. Hypotheses of this study were created based on easy/difficult gift recipient tendencies from Otnes et al.'s 1993 research. In their study, difficult recipients tended to be older, such as grandparents or more distant relatives, while easy recipients were most commonly categorized as being children and same-gender friends, in terms of gift selection. However, these labels were tendencies in their study and not a generalized fact. Due to there being considerable differences between Otnes et al.'s (1993) research population and mine, my participants were asked to rate their levels of difficulty as givers as means of identifying and verifying their perceptions of difficulty in the gift giving process.

The results showed that the givers' levels of difficulty and emotional importance relative to the recipients did not affect their virtual shopping time. However, particular types of recipient group or social role caused more stress to the givers. The difficult recipient group showed higher gifting anxiety. Above all, in-laws stressed givers the most whereas child and same-gender friend caused the least stress.

In addition, emotional importance is also an essential factor in predicting gifting anxiety. The respondents who shopped for a gift for a recipient in their imagination who they were close to were more likely to show higher states of anxiety than those who were not close to the recipients. The findings from this study confirmed that people apparently

had gift giving anxiety which was differentiated by the types of recipients and also by their sentiment toward gift receivers.

When combining two independent variables of types of recipients (easy/difficult) and emotional importance, the findings of this study supported the first hypothesis, "The givers with difficult recipients in a strong emotional importance setting would display higher states of anxiety than those with easy recipients in a weak emotional importance setting." Yet, the second hypothesis, "The givers with difficult recipients in a strong emotional importance setting would take longer to select a gift than those with easy recipients in a weak emotional importance setting," was not supported.

The findings confirmed that people apparently had gift giving anxiety which was differentiated by the types of recipients and also by their sentiment toward gift receivers. Gift consumers expect gaining rewards or avoiding punishments through gifts. A gift should come with a "premium" for their relationship.

Most marketers aspire to understand consumers, while psychologists aim to study human behavior in general. It would be a good collaboration for marketers and retailers to not just privately but dynamically work with psychologists to understand vital consumer insights about gift-buying customers. Gift giving does not exist to create stress or conflict between giver and receiver but to bring some benefits to their relationship. Marketers may be able to help gift consumers buffer their tensions by using a psychological perspective of consumers, such as providing more gift advisors who can give professional advice and guidance on gift giving. Thus, advertising gift advisors may foster awareness of their tensions that could stimulate further study and resolution for customers.

Gifts hold meaning for both the giver and the receiver, and as such, gifts should not be considered simple objects. Some individuals are very attached to the object in order to achieve their goals as a gift giver. I hope that the findings of this study will encourage others, including social psychologists, to further investigate the existing conflicts that people face when performing the traditional norm of gift giving.

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Education Facilitating Students' Comfort with LGBT People

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Keywords: LGBT, LGBT Education, LGBT Comfort Levels

Abstract

Intolerance for the lesbian, gay, bisexual and transgender (LGBT) community is often intensified by a lack of knowledge and understanding between heterosexuals and the LGBT community (Getz & Kirkley, 2006). The central question in this study was "What is the relationship between education on the college campus and one's comfort level with LGBT people?" The researchers predicted that those students who have received education on LGBT issues would be more comfortable with the LGBT population than those students who did not. Participants were $N = 55$ students from a university in Wisconsin in this nonrandom pilot study. Survey data was statistically analyzed using frequencies, cross-tabulations, mean comparisons, and a reliability analysis. Results indicated and supported the hypothesis that receiving education on a college campus can make an individual more comfortable with the LGBT population. Specific implications for practitioners would be to include LGBT topics and/or issues into their curriculum to provide more information to students in order to increase their comfort levels of the LGBT population.

Introduction

Intolerance for the lesbian, gay, bisexual and transgender (LGBT) community is often intensified by a lack of knowledge and understanding between heterosexuals and the LGBT community (Getz & Kirkley, 2006). Wright Jr. and Cullen's (2001) research shows that gay and lesbian individuals are the most frequent victims of hate-motivated violence. Is there a way to lessen hate motivated-violence to the LGBT population through education? The researchers planned to establish, through the reviewed literature, that education on the college campus has an impact on an individual's comfort level with LGBT people. A survey was then conducted using a sample of college students, ages 18 and older, regarding courses taken on their campus and their comfort level of LGBT people.

Literature Review

The following literature was reviewed to determine if there was a relationship between a college student's comfort level of LGBT people and any academic classes relating to the topic. College students enrolled in Psychology of Homosexuality and Prejudice courses were the main sample in the reviewed literature. Also sampled were students in Human Sexuality and other Psychology courses. The literature examined whether or not the educational courses decreased levels of homophobia in students. Results were similar throughout the literature with findings showing that the majority of students enrolled in these classes reported being more comfortable with LGBT people. Also, students enrolled in these courses reported a significant reduction in homophobia and higher acceptance levels of LGBT people.

Pettijohn II and Walzer (2008) researched individuals enrolled in college courses, such as Psychology of Prejudice and Introductory Psychology. They wanted to see if, at

the completion of the course, students would report a decline in prejudice and negative attitudes toward the LGBT population. As predicted, the students did report a decline after taking the Psychology of Prejudice course. However, there was no significant decline in the data reported for the students who completed the Introductory Psychology courses.

Getz and Kirkley (2006) explored the issue surrounding the lack of LGBT education on religiously affiliated college campuses. The study looked at the impact of presentations given to the campus through a program called the Rainbow Educator. Results showed that participants were more willing to be allies to the LGBT community after the program. Overall, the university community seemed to have less homophobic comments and fewer slurs, and people were more willing to challenge homophobia when it occurred.

Waterman et al. (2001) centered their research on heterosexual students and their outlook on sexual minorities while being enrolled in a Psychology of Homosexuality course. The goal of this research was to see how much of an impact (if any) this course had on the students' perceptions of LGBT people. Findings revealed that the majority of the students had a decreased level of homophobia at the conclusion of the class. The research also found that a student was more likely to support a peer coming out after completing this class instead of wondering why an individual was homosexual.

The purpose of Wright Jr. and Cullen's (2001) study was to determine students' levels of homophobia after participating in a human sexuality course. Students contributed in lectures, readings, panels, and watched a speaker. Results showed that students had a significant reduction in homophobia. When comparing the first to the last week of class, the students' homophobia levels were reduced from exposure to LGBT education.

Research on the acceptance of LGBT people is lacking significantly. It is known however, that taking courses on LGBT awareness may significantly change one's attitude to be more comfortable with the LGBT population. The present research sampled students at a rural college to determine whether any classes they had taken discussed the LGBT community, and if their attitudes toward them had changed. When looking at the current literature, the gap the researchers hope to fill is to determine if any course on the college campus promotes higher levels of acceptance instead of one specific course such as Psychology of Prejudice. Lastly, the researchers hope to support that education can increase people's comfort levels of the LGBT community.

Theoretical Framework

This study is informed by the Bioecological theory (Papalia, Olds, & Feldman, 2004), which states that development happens through complex processes through the relationships of a developing person and their everyday environment. According to the Bioecological theory, a person is highly influenced by their environment.

The Bioecological theory includes four levels of environment that influence one's development. The two levels that apply to this theory are the micro and macro systems. The micro system includes the education that one would receive at home or in the schools about LGBT people. One's culture, or macro system, also plays a role in that person's comfort level of LGBT people. The Bioecological theory would predict that culture and education would have a significant impact on an individual's comfort level of LGBT people.

Purpose Statement

The purpose of this study was to examine if education on the college campus positively influenced an individual's comfort level with LGBT people. With a sample of college students from a Midwestern university, it was the researchers' hope that educators on a college campus would use the results to distinguish the importance of education on comfort levels and apply it to the curriculum. The researchers also hoped that the results of this study would have a significant enough impact to be used at a lower level of education such as the middle or high school level. Education at any age can influence one's comfort level significantly. The central question in this study was, "What is the relationship between education on the college campus and one's comfort level with LGBT people?" The researchers predicted that those students who have received education on LGBT issues through a course taken in college would be more comfortable with the LGBT population than those students who did not. The previous literature determined that more education on LGBT issues increases comfort levels in students.

Method

Participants

The site of the study was at a university in northwestern Wisconsin. The participants in this study were $N = 55$ students (29 females and 26 males.) Of the female participants, 16 identified themselves as being comfortable with LGBT people, whereas 12 felt moderately comfortable and one felt uncomfortable with LGBT people. Of the male participants, ten identified themselves as being comfortable with LGBT people, whereas 14 felt moderately comfortable and two felt uncomfortable with LGBT people. Overall, 26 of the participants identified themselves as comfortable with LGBT people, 26 identified themselves as moderately com-

fortable and three identified themselves as uncomfortable with LGBT people.

Participants' age breakdown is as follows: 4 were between the ages of 18 and 19 (2 males and 2 females,) 24 were between the ages of 20 and 21 (10 males and 14 females,) 15 were between the ages of 22 and 23 (7 male and 8 female,) 7 were between the ages of 24 and 25 (4 male and 3,) and 5 were 26 years old or older (3 male and 2 female.)

Research Design

In this survey research, the researchers set out to generalize the findings to a larger, yet similar population (Babbie, 1990). This was done so that inferences could be made about characteristics, attitudes, or behavior of this population. The researchers wanted to determine individual student comfort levels with the LGBT community from our sample population, and then be able to use that data to generalize about a larger population of similar students on campus. The survey's intent was to obtain attitudes from a cross section of the population at one point in time, making it a cross-sectional study design. The form of data collection was self-administered surveys. The rationale for using this method was that it was the most efficient method to obtain data on campus with the rapid rate of the research course, a convenient location, and a fast return of data. The population was the university student population and the sample was male and female students. The research study used a non-random purposive and quota sampling design, collecting data in a popular dining facility on campus to obtain a large selection of students. The researchers used nonrandom sampling in order to acquire as many participants as possible in a short period of time. The ethical protection of human subjects was provided by completing the Human Subjects Institutional Review Board (IRB) training. The study was approved by

the IRB.

Data Collection Instrument

To discover student comfort levels regarding LGBT individuals, a survey was designed. Included in the survey was a cover letter with an implied consent form that described the study, definition of terms not commonly known, risks and benefits of taking the survey, time commitment, confidentiality, voluntary participation, and contact information of the researchers and the supervisor. There were also instructions for completing the survey.

The survey consisted of two demographic questions regarding age and gender. The survey also included statements regarding comfort levels that the researchers used to compare and analyze the data. The survey was comprised of nine closed-ended statements based on a 5-point Likert scale that measured student's knowledge and attitudes ranging from strongly disagree (one) to strongly agree (five). Questions were informed by the Bioecological theory and the reviewed literature that determined factors related to students comfort levels with LGBT individuals.

The survey instrument has face validity, which means there is a logical connection of the instrument's questions to the concept and research question. The questions were connected to students comfort levels with LGBT individuals because they were inspired by the literature. The survey instrument also had content validity, which means there are a variety of statements addressing the larger topic of LGBT education and student's comfort levels regarding the LGBT population. The questions asked included student comfort levels, experience with, and knowledge of LGBT individuals. The survey was piloted to two undergraduate students to increase validity. This feedback signified that the survey was understandable and could be given to the participants after

the wording on a few questions was revised.

Procedure

The data for this study was collected on campus during November 3rd, 2008 and November 5th, 2008. The purposive sampling design directed the researchers to choose a dining facility where they could sample male and female students. The researchers did not randomize as they approached individuals sitting at tables in the dining facility, in order to be inclusive. Potential participants were asked if they were indeed students and if they had time to fill out a survey. The researchers read the implied consent to the students and explained that they could keep the first two pages of the instrument. To maintain confidentiality it was explained to the participants that the researchers would be sitting at a table near the entrance of the dining facility, which is where they were to drop off the finished surveys into a large white envelope. The researchers did not stand near the participants to preserve confidentiality. The researchers kept the completed survey instruments in a desk drawer of a locked room at one of the researcher's homes until all the data could be analyzed.

Data Analysis Plan

The data used was first cleaned and checked for any missing data. One returned survey was lacking the participant's age so it was discarded and not included in the results of the study. Then, the cleaned surveys were coded using acronyms for each of the variables. The first two questions were demographic variables including gender and age. The researchers used one independent variable which asked the participants comfort level regarding LGBT people (COM). Each of the nine survey statements were treated as dependent variables and were given an acronym name. The survey

statements and acronyms included: to determine if the participant felt it was important to receive education on LGBT issues (EDU), if they believed that taking a college course on LGBT issues could make an individual more accepting (ACP), if the participant had taken a course primarily based on LGBT issues (CRS), to determine if the participant was informed about LGBT Awareness Month (LAM) and to determine if the participant has ever attended an event during LGBT Awareness Month (EVT). Other statements included: if the participant was informed of National Coming Out Day (COD), to determine if the participant was informed of the campus gay straight alliance group (OSG), to determine if the participant has ever attended a gay straight alliance meeting (OSM) and finally to determine if the participant has a friend or acquaintance who identifies as an LGBT individual (FRD). The computer program Statistical Package for the Social Sciences (SPSS) was used to analyze the data. The level of analysis in this study was the individual. Since the researchers compared groups based on comfort levels, the data analysis included frequencies, cross-tabulations, mean comparisons, and the reliability analysis Chronbach's alpha. Due to the small and nonrandom pilot study sample, significance testing was not performed.

Results

The researchers used the computer program Statistical Package for the Social Sciences (SPSS) to analyze the data that had been collected. The analyses that were performed on the variable were frequencies, cross-tabulations, mean comparisons, and a reliability analysis. The first analysis was a frequency distribution analysis, which indicated that there was no missing data from our surveys, but it did show that one of the independent variable categories, comfort level (COM), was significantly skewed so the research-

ers decided not to apply this information to the results.

Cross-tabulations were run with the independent variable, COM. For EDU and ACP there appeared to be a difference between groups, with the majority of the participants that identified as comfortable agreed or strongly agreed, whereas the majority of those that identified as moderately comfortable were undecided. For CRS, LAM, EVT, COD, OSG, OSM and FRD, there again appeared to be a difference between groups with the majority of the comfortable participants agreed or strongly agreed and the majority of the moderately comfortable participants either disagreed or strongly disagreed.

A reliability analysis was run to indicate if our variables were a reliable index to measure our major concept—college students' comfort levels with the LGBT population relating to education previously received. Chronbach's alpha is a measure of reliability and in our analysis was computed to be 0.885. This value indicated that our survey items were a reliable measure of our major concept.

Table 1

Percent Responses for Survey Item by Comfort Level with LGBT

EDU: It is important to receive education on LGBT issues

	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree	Total
Comfortable	11.5%	19.2%	3.8%	19.2%	46.2%	100.0%
Moderately Comfortable	46.2%	23.1%	15.4%	3.8%	11.5%	100.0%

ACP: I believe taking a college course on LGBT issues could make an individual more accepting of the LGBT population

	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree	Total
Comfortable	0.0%	11.5%	15.4%	34.6%	38.5%	100.0%
Moderately Comfortable	3.8%	15.4%	46.2%	30.8%	3.8%	100.0%

CRS: I have taken a course primarily based on LGBT issues

	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree	Total
Comfortable	69.2%	23.1%	3.8%	0.0%	3.8%	100.0%
Moderately Comfortable	80.8%	15.4%	3.8%	0.0%	0.0%	100.0%

LAM: I am informed about LGBT awareness month

	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree	Total
Comfortable	15.4%	30.8%	3.8%	19.2%	30.8%	100.0%
Moderately Comfortable	34.6%	30.8%	23.1%	7.7%	3.8%	100.0%

EVT: I have attended an event during LGBT awareness month

	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree	Total
Comfortable	38.5%	30.8%	0.0%	7.7%	23.1%	100.0%
Moderately Comfortable	80.8%	15.4%	0.0%	0.0%	3.8%	100.0%

COD: I am informed about national coming out day

	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree	Total
Comfortable	23.1%	19.2%	3.8%	19.2%	34.6%	100.0%
Moderately Comfortable	46.2%	26.9%	11.5%	11.5%	3.8%	100.0%

OSG: I am informed about the gay straight alliance group on campus

	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree	Total
Comfortable	11.5%	19.2%	3.8%	19.2%	46.2%	100.0%
Moderately Comfortable	46.2%	23.1%	15.4%	3.8%	11.5%	100.0%

OSM: I have attended a gay straight alliance group meeting

	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree	Total
Comfortable	69.2%	23.1%	0.0%	0.0%	7.7%	100.0%
Moderately Comfortable	80.8%	19.2%	0.0%	0.0%	0.0%	100.0%

FRD: I have a friend or acquaintance on campus that identifies as an LGBT person

	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree	Total
Comfortable	23.1%	15.4%	0.0%	11.5%	50.0%	100.0%
Moderately Comfortable	46.2%	15.4%	7.7%	7.7%	23.1%	100.0%

Table 2*Descriptive Statistics of Survey Items by Comfort Level with LGBT**EDU: It is important to receive education on LGBT issues*

	Mean	Standard Deviation	Range
Comfortable	4.2	1.0	4.0
Moderately Comfortable	3.0	0.9	4.0

ACP: I believe taking a college course on LGBT issues could make an individual more accepting of the LGBT population

	Mean	Standard Deviation	Range
Comfortable	4.0	1.0	3.0
Moderately Comfortable	3.2	0.9	4.0

CRS: I have taken a course primarily based on LGBT issues

	Mean	Standard Deviation	Range
Comfortable	1.5	0.9	4.0
Moderately Comfortable	1.2	0.5	2.0

LAM: I am informed about LGBT awareness month

	Mean	Standard Deviation	Range
Comfortable	3.2	1.5	4.0
Moderately Comfortable	2.2	1.1	4.0

EVT: I have attended an event during LGBT awareness month

	Mean	Standard Deviation	Range
Comfortable	2.5	1.6	4.0
Moderately Comfortable	1.3	0.8	4.0

COD: I am informed about national coming out day

	Mean	Standard Deviation	Range
Comfortable	3.2	1.7	4.0
Moderately Comfortable	2.0	1.2	4.0

OSG: I am informed about the gay straight alliance group on campus

	Mean	Standard Deviation	Range
Comfortable	3.7	1.5	4.0
Moderately Comfortable	2.1	1.4	4.0

OSM: I have attended a gay straight alliance group meeting

	Mean	Standard Deviation	Range
Comfortable	1.5	1.1	4.0
Moderately Comfortable	1.2	0.4	1.0

FRD: I have a friend or acquaintance on campus that identifies as an LGBT person

	Mean	Standard Deviation	Range
Comfortable	3.5	1.7	4.0
Moderately Comfortable	2.5	1.7	4.0

Discussion

Overall, the results supported the hypothesis that receiving education on a college campus can contribute to an individual being more comfortable with the LGBT population (Pettijohn II & Walzer, 2008; Getz & Kirkley, 2006; Waterman, et al., 2001; Wright Jr. & Cullen, 2001). The researchers will begin by discussing each dependent variable

in relation to the independent variable, in terms of how the results agreed with the theoretical framework and/or the literature. Other topics addressed will include limitations, implications for practitioners, implications for future research, and concluding remarks.

Results indicated a difference between the groups comfortable and moderately comfortable. Those participants that identified as comfortable with the LGBT population were more likely to: agree that it is important to receive education on LGBT issues, agree that taking a college course on LGBT issues would make an individual more accepting of the LGBT population, have taken a course primarily based on LGBT issues, be informed about LGBT Awareness Month, National Coming Out Day and the gay straight alliance group on their campus, have attended an event during LGBT Awareness Month and/or attended a gay straight alliance meeting, and have a friend or acquaintance on campus who identifies as an LGBT person. These findings were supported in the literature which reviewed if LGBT educational courses on the college campus decreased levels of homophobia in students. Results were similar throughout the literature, with findings being that the majority of students enrolled in these classes reported being more comfortable with the LGBT population. Also, students enrolled in these courses reported a significant reduction in homophobia and higher acceptance levels of LGBT people (Pettijohn II & Walzer, 2008; Getz & Kirkley, 2006; Waterman, et al., 2001; Wright Jr. & Cullen, 2001).

Those participants who identified as moderately comfortable with the LGBT population were more likely to be undecided or disagree on the previously mentioned survey statements. The researchers believe this may be because they indicated not having education on LGBT issues, whereas those who identified as being comfortable with the LGBT

population were more likely to have had some education on these issues.

The Bioecological theory indicates that an individual is highly influenced by his or her environment and education (Papilia et al., 2004). Our findings indicated that having received education on LGBT issues and being exposed to different events and programs on campus influenced a person's comfort level with the LGBT population.

Limitations.

The researchers had a small sample size to generalize and compare to the larger population of college students at a Midwestern university. Researchers were unable to randomize their sample in order to acquire as many participants as possible. Also, significance testing was not performed due to the study being small and nonrandom.

Implications for Practitioners

The results indicated that education on a college campus can improve an individual's comfort level with the LGBT population. Professionals can use this information to increase LGBT awareness by adding it to course curriculum on the college campus. LGBT awareness on a college campus can be increased not only through more content of LGBT issues in course curriculum but creating more classes based solely on LGBT issues. Awareness can also be improved through gay straight alliance groups hosting more events throughout the entire school year on the college campus instead of primarily during LGBT Awareness Month. Not only can LGBT content be included in courses, but colleges can provide educational brochures and pamphlets for their students and even professors and other faculty members. Getz and Kirkley (2006) support that the more education one has, the less likely they will be to verbally harass

an LGBT individual by using homophobic slurs and/or resort to other forms of violence against the LGBT population. This research can also be applied to students' education at all ages, not just at the college level. Through this, we can start teaching acceptance at a younger age.

Implications for Future Research

The researchers believe that if this study were to be replicated, it would be beneficial to use a random sample that is larger in size in order to generalize to all college students. To gather richer data, it would be useful to conduct qualitative interviews with students regarding what helps or hinders their feeling comfortable with LGBT people.

Conclusion

As a result of this study, the researchers hope that more professionals will recognize the importance of LGBT awareness through education and apply it to their field of study. The LGBT population is one that is often overlooked and deserves to be respected and accepted, not just tolerated. In the field of Family Studies, it is important to be educated and knowledgeable on these issues in order to support and advocate for LGBT people and their equal rights as citizens. The researchers hope that education and awareness is not only taught at the college level but also throughout the entire educational career of a student, beginning at the elementary level.

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The Effectiveness of Game-based Learning

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Keywords: Digital Game-Based Learning, Training, Generations, Global Learning

Abstract

Digital game-based learning has emerged as a new technology to address training interventions in the business world. As technology increases and the workforce is seeing a generational shift, business must find alternatives to address training. Training professionals are beginning to recognize the benefits of this training method and the practical application of games in a business context. This article discusses digital game-based learning (DGBL) and how it addresses the needs of the common learning styles described as visual, aural, read/write and kinesthetic. The author explores the changing needs of the different generations in today's workforce and their respective generational preferences. Finally, an explanation is provided as to how global organizations can benefit from DGBL.

Introduction

As business and industry see a continual push to compete on global levels, the need to address employee development and training interventions in the most effective and efficient possible way has become evident. Organizations are seeing the need to retain their talent through various methods. The faces of business and industry are changing,

as Generation X is moving into more positions of power and influence and Generation Y is beginning to enter the professional workforce in large numbers. This shift is forcing organizations to address the different and changing learning styles of each generation. Additionally, rapidly changing technology plays a vital role in these interventions. In the 1980s and 1990s, companies were forced to abandon traditional technology such as typewriters for word processors and computers. In the 21st century, companies have been forced to adapt to new and changing technologies such as games and interactive learning. Although digital game-based learning (hereafter "DGBL") has been around for decades, business and industry are now beginning to take note of the potential high level of effectiveness this method can achieve.

What is Digital Game-Based Learning?

While the first video game can be traced back to 1961 (Herman, Horwitz, Kent, & Miller, n.d.), the actual origin of games can be traced back as far as 3000 B.C. ("History", 2006). Throughout the years, there is no question that several variations of games have been used to assist in learning—whether it be logic, math skills or even some of the most basic skills of early childhood. Given the nature of games, it would seem natural that training professionals would use them in establishing set business objectives for training purposes. Combining the most basic components of games into a digital format through technology to accomplish business goals leads to DGBL. Although games have been around for many years, the focus is now shifting for business and industry to realize that games have the power to actually teach memorable and lasting concepts (Billhardt & Kolb, 2008). By understanding the impact DGBL can have on employees, organizations will be able to use and develop this resource to

effectively assist in the learning function. When adults view training as both interactive and challenging, it changes the concept of training from something to be endured to something that is anticipated and welcomed.

Digital games can be presented in a variety of ways including multiplayer games, role-playing games, strategy, simulations, puzzles and platform style games (Leveckis & DiRomualdo, 2008). While a single concept can be used, particular business issues can often be addressed by using multiple game concepts. For example, multiplayer games offer tremendous potential for corporate learning as they offer collaborative aspects, and strategy games can assist in supporting future strategic decision making.

Learning Styles and Needs

Even the most basic of games can easily address the varying needs of learners. Although it has been known for some time that an individual's learning style can greatly impact the success of learning initiatives, little credit has been given to the ability of DGBL to address a common typology of learning styles known as VARK (visual, aural, read/write, kinesthetic) (Fleming & Mills, 1992). Through digital games, the learner is able to address each of these four preferences. Effective digital games can use a series of visual representations for the visual need, along with vocal narratives that address the aural need, and text to address the read/write need. Although online learning has addressed these areas for years (Drago & Wagner, 2004), digital games are incorporating a more interactive method of training as well as the ability to address the kinesthetic needs. Most adult learners both need and appreciate some form of feedback that informs them of their progress. Digital games help meet this need and reinforce learning objectives.

Along with learning styles, the needs of adults in a learning environment were clearly described by Malcolm Knowles, in that adults are generally self-directed and learn through experiences (Connor, 2004). While that concept has seemed to hold steady through the years, organizations are faced with technological changes and tightening budgets that alter the traditional training practices. Global companies are being forced to deal with increased complexity and growing expectations such as a more diverse workforce, remote employees and limited resources (Kossoff, 2008). These expectations also transfer to the training and development departments within an organization. Online training has already proven to be a cost effective, flexible and interactive way to address training needs with organizations (Jewell, 2007). The expense of transportation, lodging, meals and expenses for trainers and participants has led some organizations to pursue online training as an alternative to traditional classroom-based education. By simply adapting current online training initiatives into game-based learning situations, the organization is opening a door for further learning success. Games can often increase concentration, sharpen reflexes and create a positive and memorable experience resulting in higher learning transfer (Billhardt & Kolb, 2008).

The Generational Gap

Another challenge faced by global organizations where DGBL can assist is the fact that today's workforce spans across three or four different generations. Generational differences can affect everything including motivation, management and productivity (Hammill, 2005). All these factors apply to an organization's learning function and effectiveness. Learning professionals must effectively use DGBL to address the varying needs of these different generations, which have been well-documented in recent years. The baby

boomers, born between 1946 and 1964, generally prefer to work in an environment that makes them feel needed and valued; Generation X, born between 1965 and 1980, needs personal freedom but prefers an environment with structure; and Generation Y, born between 1981 and 2000, needs an entrepreneurial environment with goals in mind (Hammill, 2005). These differing generational factors can make learning initiatives a challenge.

Even as the youngest generation in the current workforce, Generation Y is becoming an ever-present group within growing organizations. It may seem obvious that Generation Y is technologically savvy and their presence in the workforce can be attributed to the ever growing demand for online learning. Adults who have grown up with computer technology and interactive learning typically expect training to be presented in a manner that is familiar to them. This group also needs information to be presented in a short and clear manner (Rose, 2007). Due to these factors, DGBL appears to be a natural alternative for presenting training initiatives to this generation, and it also addresses the needs of the older generations in varying ways.

As the baby boomer generation seeks personal fulfillment and an environment that enables them to work efficiently, training can sometimes seem tedious and unnecessary (Hammill, 2005). By presenting training through DGBL, organizations can meet the need of personal fulfillment through accomplishing tasks within the game setting. This method also allows for time-sensitive and efficient alternatives to the traditional classroom experience that some baby boomers may be accustomed to.

Furthermore, DGBL can meet Generation X's desires for challenge within work and self-reliance (Hammill, 2005). This generation is motivated by new challenges and opportunities to build new skills (Nagle, 2007), which is a

fundamental element of DGBL. This method also presents the opportunity for Generation X to be self-reliant in the completion of a training task as DGBL can be set up for independent completion and progress. The challenge now falls on to the developers of digital game-based training aides to ensure that all generational factors are considered.

Global Needs

The increase of globalization within organizations has presented a need to address differing cultures, borders and geographical gaps. Training professionals must understand these needs and be able to serve global markets by understanding the specific business needs and knowing how to use technology to improve service and reduce costs (Kossoff, 2008). These needs present a challenge in the traditional setting of training and development. Through the use of appropriate DGBL solutions, geographical gaps can be addressed by connecting employees in different areas online to compete and work together. Organizations must also take into account cultural differences when developing DGBL solutions. Although some games are universal, others may not be appropriate for differing parts of the world. If these cultural differences are addressed properly, organizations can greatly benefit through DGBL.

Conclusion

Training and development has seen many changes throughout the years. As individuals progress through organizations and leadership changes hands, training professionals are challenged to provide the best alternatives possible. Training professionals must take note of the differing factors and the new challenges presented. Organizations are encountering professionals with various learning needs and expectations. Generational gaps are now more prevalent then they

have ever been. Successful global organizations are forced to not only recognize these challenges but embrace and address these needs. Through the use of DGBL, a successful organization can meet the various needs of their employees. While the simple concepts of games are a time-honored tradition, training professionals must recognize the ability that digital games have to meet the various needs in the workforce. Digital game-based learning provides the opportunity to develop situations and challenges through technology that allow for everything from team-building to independent work. The challenge is now for organizations to recognize the various benefits of DGBL and incorporate this method into their training and development practices.

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Natures Hidden Secret, Melodic Shakers, Stone To Taste, Natural Beauty I

Kate Atkinson

Undergraduate Student, Bachelor of Fine Arts

I take pleasure in creating objects that are not only engaging for the audience, but have a hidden purpose or function; what first appears to be a purely sculptural object is actually an object that possesses a functional purpose that emerges only in the wake of the sculptural entity.

In recent studies, I have concentrated on manipulating copper from its rigid form, to soft and gentle domed forms. These forms are comprised of folds and dimples, which give the appearance of the rigid metal gently slouching and folding back on itself, seemingly to be highly malleable. These pieces were inspired by aesthetic experiences including collapsing clay on a potter's wheel and sand ripples on the bottom of lakes created by incoming waves.

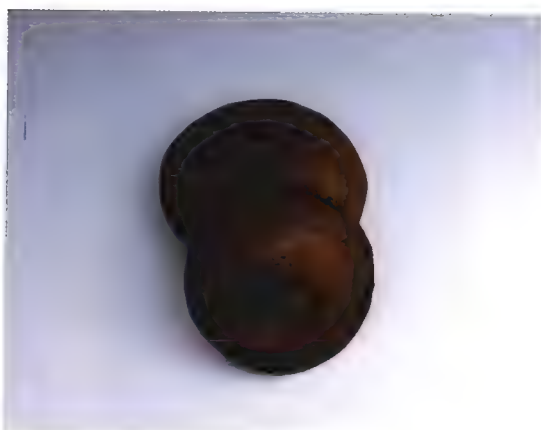
As I begin to develop an idea, I look to nature for inspirational forms. I gain inspiration by taking walks in the park, along the river, or in the woods simply observing and sketching: cloud formations or ripples in the water, or collecting stones and pebbles or plants and seedpods. I am then able to refer to my sketches or collections for generating pieces. Each study I complete through a series of related forms teaches me many things. I become more informed about the forms and techniques as I work through the pieces. Another benefit to working in a manner of related pieces is the accrual of a cohesive collection of work at the conclusion of each series.

I alternate between stages of experimentation and developing a series of related pieces to form a body of work. I think it is important to experiment with a variety of materials and approaches to solving a single problem. Experimentation draws to a close, as I choose a direction to focus a series of pieces.

Many of today's lifestyles are fast-paced and life can begin to seem meaningless. I create art because it is a process of slowing life down and getting in touch with my environment; it is a way of expressing my energy into something meaningful. It is important to slow down and appreciate what my surrounding environment. I subscribe to Deborah Haynes' wisdom; she writes, "Knowing your environment means studying the elements that make up your place in the world." By allowing myself to slow down and appreciate the natural environment I am living in, I can become more aware of changes, cycles, and transformations naturally occurring around me. These natural processes are what inspire me to create art, and reflect nature's beauty and nuances. Marc Chagall once said that, "Great art picks up where nature ends."



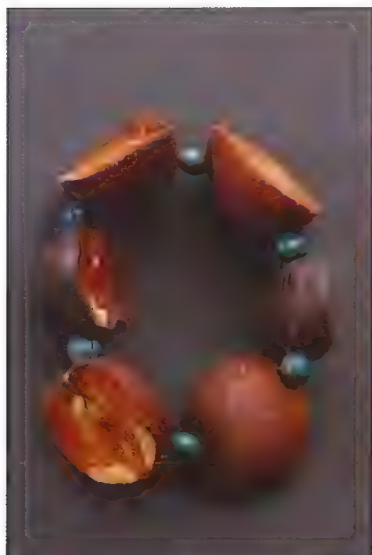
Nature's Hidden Secret (spice shakers) (2006)
copper, silver, rubber
12" x 5" x 1.5"



Melodic Shakers (spice shakers) (2006)
copper
5" x 3.5" x 1.5"



Stone To Taste (spice shakers) (2006)
copper
6" x 4.5" x 1.5"



Natural Beauty I (bracelet) (2006)
avocado pits, natural seed pods, elastic
4" x 3" x 1"

**you have your father's eyes, Detail of you
have your father's eyes, paintings done as
my dad that he would have painted and
titled 1-16, untitled**

Jennifer Ekstrand

Undergraduate Student, Bachelor of Fine Arts

My current body of work investigates the constructs of the human psyche and memory. Through an exploration into family histories and genealogies, I construct narratives through painting, photography and photographic transfer that mimic both created and degenerated memories. Of primary importance in this body of work is the passing of my father three years ago. It was this event that guided my interest in remembering that which is no longer there.

My photographic series, you have your father's eyes, utilized Polaroid film to explore ideas of memory and passing on of traits, as well as what it is we leave behind. This investigation resulted in a series of twenty-seven photographs in which I was disguised as my father in a number of hats that once belonged to him.

To come to terms with my father's passing, I embarked on a quest to generate a memorial of sorts. The end result being the plaid painting series that I painted while assuming the role of my father titled paintings done as my dad that he would have painted and titled untitled 1-16. I chose the subject matter (plaid patterns), painted the paintings, and consequently showed them as my father. They are what he would have painted had he been a painter. The resulting paintings found a strong connection to the history of painting, drawing references from modernist painters such as

Mondrian. The series also shows references to contemporary everyday life such as urban landscapes and fashion. It is this realm of disconnect that my work often inhabits. I am interested less in the direct representation of the individual, but rather their trace. That which they leave behind.

While my work does not stray from constructed personal narratives and beliefs, I do seek to explore a more all-encompassing idea of memory. With the on going series of photographic transfers on wood, I present a metaphorical representation of the very residue of memory that I began working with in my plaid paintings. The transfers are placed at different heights off the wall so as to cast a shadow from one to the other down the line. This physical remnant evokes the coming forward and falling back of the transitional periods of our lives. We are left, in this series, with a progression of vaguely recognizable images trapped somewhere between pleasure and pain in a much greater struggle, but within this timeline there occurs separate individual moments directly representative of a lifespan.

*you have your father's eyes, Detail of you have your
father's eyes, paintings done as my dad that he would
have painted and titled 1-16, untitled*

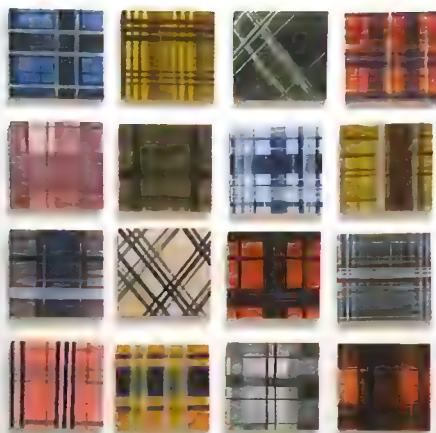
87



you have your father's eyes (2007)
Polaroid photos
14" x 35"



Detail of you have your father's eyes



paintings done as my dad that he would have painted and

titled 1-16 (2007)

acrylic on wood

25" x 1/2" x 27"



untitled (2008)

image transfer on panel

23" x 3" x 39"

300 Dollars Worth of Candy Bar, 324 Pounds of Wisconsin Highway, Left Wing Right Wing (detail), Slapstick

Cheyenne Seeley

Undergraduate Student, Bachelor of Fine Arts

Many times we take for granted the true meaning of our interactions, reducing them to superficial, possibly empty chatter. Through language, the original compounded images of the words we use become abstracted to the point where they no longer signify the actual image. What I try to do is create images, objects, situations that regain the significance they once had, the representation of themselves. This brings attention to the double standard we create between language and expectation. We expect honesty and strive to be honest but plead for our language not to be taken literally.

In 'Left Wing Right Wing' the significance of our use of language is apparent. By literally interpreting the phrases and illustrating them visually in the context of a gallery I wanted to draw attention to, not just the use of the particular phrases, but the way that these particular phrases, in their severity represent the way that all of our language and our expectations in regards to our language, is contradictory.

Another specific illustration of this in my work involves the continual purchase of a single candy bar, the Butterfinger. The specific brand Butterfinger was chosen because of its pop-cultural significance and linguistic humor. Through the process with the '300 Dollars Worth of Candy Bar' I am exploring the ability to extract personal significance and value from the otherwise consumable byproducts of our seemingly economic existence. The concept for this

process derived from my wanting to make something happen that seemed utterly unrealistic, to prove something to myself and attempt to prove the same thing to others; I can purchase a candy bar at one location and take the same candy bar to as many other locations as I want, to be purchased again. I found a technological loophole in a system that I blindly trusted, and I ran with it.

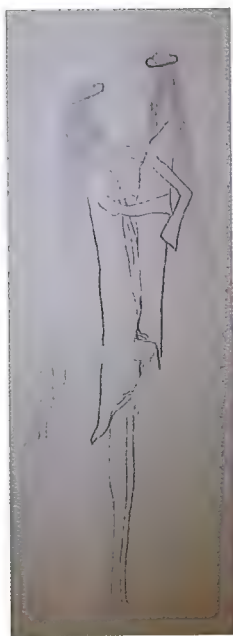
For '324 Pounds of Wisconsin Highway' I removed scraps of broken road from the state highways around the area and re-placed them here to address the double standard of my belief in property ownership. I developed a formula and was able to claim the percentage of state highway I pay for in one year. I am left with the absurd remains of what I have paid for, but was cast aside as soon as it had become unusable for its original task. The concept came from the literal interpretation of the fact that since I had paid for it, it should be mine, and I should take responsibility for it.



300 Dollars Worth of Candy Bar



324 Pounds of Wisconsin Highway



Left Wing Right Wing (detail)



Slapstick

Room 423, Room 422-2, Room 415, Room 408

Jena Weiler

Undergraduate Student, Bachelor of Fine Arts

A numbness blankets my senses in response to unrelenting tragedies. The root of my most recent series is the fear of losing a loved one. This fear has evolved into my current theme; Containing. My paintings evoke the presence of skin, the body's container, and celebrate what it contains. Skin holds our bodies together physically, but I also think about our body's skin as a metaphor for how our mind shields ourselves emotionally from unacceptable truths. Native beauty to subdue reality is something I reflect on in my work. It describes how I decide the amount of information I can take in before finding a necessary distraction.

Skin n

1. the external protective membrane or covering of an animal's body, consisting of the dermis and epidermis
 2. somebody's skin, especially on the face, in terms of its color and appearance
 3. a relatively thin but protective layer closely surrounding the flesh of fruit or vegetable
 4. a thin tough casing or cover that fits closely around something to hold in, protect, or preserve the enclosed material
 5. the outer protective covering of a structure such as an aircraft
- selected definitions obtained by the Encarta World English Dictionary

I paint with oils on white paper specifically because of the paper's porous texture and malleability. The paper is oversized and adhered to a wooden panel being embossed as the paper starts to wrap over the panel to become skin-like. I utilize the formality of a stark white border to imply a sense of place. Photographed self-portraits are the subject matter for these paintings. I focus on one cropped area, painting on the center of the surface, to bring out its subtle abstract beauty. My favorite part of this process is stripping off the tape that masks the untouched, white border. The pleasure is in revealing the sharp pristine edge defining the space of the enriched form. It is that moment of harmony between hard and soft; structure and instability; and masculine and feminine that I find compelling.

My previous body of work was a study of my mom's illness. I reflected on her past, her present and her relationships. My source materials were images of her, images in relation to her and artifacts from visits home. The work formed the series, *Raw*, which led me into a smooth transition to my current series. Both of these investigations directly relate to the body and are combinations of two-dimensional and three-dimensional work deriving from the fear of losing a loved one.

In times of dismay our body protects us, making us numb to truths. My art has often been described as truthful and beautiful. In my current work I want to add an element of naïve beauty to distract painful experiences that can come from the world. This complements the idea of our skin or mind as a protective container for our self from what we are not ready to confront. My work addresses a voluntarily unawareness to what I cannot control. I want the viewer to initially view the aesthetics of the my work and then discover the subtle reality in it. My lush paintings bring beauty and a celebration of life to a world that cannot contain enough.



Room 423 (2008)
oils, paper, panel
20" x 15"



Room 422-2 (2008)
oils, paper, panel
13" x 7.5"



Room 415 (2008)
oils, paper, panel
13" x 16"



Room 408 (2008)
oils, paper, panel
14" x 4"

Parent Communication and College Students' Sexual Attitudes

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Keywords: Adolescents, Parent Communication Styles, Sexual Responsibility

Abstract

The high teenage sexual activity and pregnancy rates in America are generally attributed to ineffective communication of sexual information (Mueller & Powers, 1990). Contemporary adolescents are faced with potentially severe consequences for engaging in risky sexual behaviors; research suggests that parents are a primary source of influence on adolescent sexual attitudes and behavior (Fitzharris & Werner-Wilson, 2004). The central research question in this study was, "Is there a relationship between parent communication styles about sex and college students' attitudes about sexually responsible behavior"? This non-random pilot study was done at a small Midwestern university, where $N = 141$ undergraduate male and females were surveyed. Data were statistically analyzed using frequencies, mean comparisons, and a reliability analysis. Observed results supported our hypothesis that participants who reported open communication styles with parents demonstrated higher levels of knowledge and comfort about sexual topics than participants who reported avoidant communication styles. Practitioners can utilize this information by educating and encouraging the use of open communication by parents. For future research, the

authors recommend a randomized and more diverse sample be used.

Introduction

Sexual education has historically been a conflicting topic among adolescents, researchers, health care providers, and parents. The common questions that arise from these groups are: who should be allowed to teach such subjects, what information is current and accurate, and how can these topics best be presented to young adults without encouraging them to participate in unsafe sexual behaviors? According to Mueller and Powers (1990), the high teenage sexual activity and pregnancy rates in America are generally attributed to ineffective communication of sexual information. Contemporary adolescents are faced with potentially severe consequences for engaging in risky sexual behaviors and research suggests that parents are a primary source of influence on adolescent sexual attitudes and behavior (Fitzharris & Werner-Wilson, 2004). A review of the current literature regarding parent-adolescent communication, the authors were led to ask: Is there a relationship between parent communication styles about sex and college students' attitudes about sexually responsible behavior? Parent communication style is defined as the way a parent verbally and paraverbally interacts to signal how content should be taken and interpreted (Miller, 2002). Additionally, sexually responsible behavior is defined as understanding and having an awareness of one's sexuality and sexual development, respect for one's self and partner, ensuring that pregnancy occurs only when welcomed, and the ability to make appropriate sexual and reproductive health choices (Coleman, 2002). College students ages 18-26 were surveyed in order to gain insight on how intra-familial communication about sexually related topics affected their attitudes about sexually responsible

behavior.

Literature Review

The review of literature on the subjects of parent communication styles regarding sex related topics and adolescent attitudes regarding sexually responsible behaviors yielded a variety of results. The majority of articles focused on adolescents and their degree of sexual activity, use of contraception and knowledge of sexual matters, degree of parental involvement in sexual education, style of parent communication on sexually related topics, and the content of conversations that occurred between the parent and the adolescent during conversations about sexually related topics. The articles focused on parents, adolescents and pre-adolescents. The samples in the literature studied adolescents with varying sexual experiences. A large void that exists in this area of research is the study of college aged students. College students have not been the center of many studies in the past; it has been adolescents (pre-teenagers and teenagers) who have been the main focus of research topics related to sexual responsibility. Despite a lack of recent research, many of the older studies provided good predictions of the consequences of sexual communication later in life. In addition to the studies of parent/child communication, the authors focused on other topics such as family structure, family intervention, and family environment.

Dittus, Miller, Kotchick, & Forehand (2004) reported on the ever-growing rate of sexually transmitted diseases and found that effective sexual communication, monitoring and parental involvement led to a decrease in sexual risk-taking behavior of children. One interesting detail about this study is that similar to the Fitzharris and Werner-Wilson (2004) study, parents' conflicting perceptions were also recognized to be a possible barrier to open communication. Many par-

ents had preconceived notions of what might cause the adolescent to participate in or think about sexual activities. For example, parents were more likely to think that open communication was the cause of increased sexual activity. In this article, the Parents Matter Program (PMP) is described and evaluated. The PMP is based on a variety of social and behavioral theories such as social learning theory, problem behavior theory, reasoned action theory, and the social cognitive theory. Each of these theories contributes to the basic principles involved in human development. The PMP intervention has three components: risk awareness, positive parenting, and sexual communication. The goal behind this program—led by research and theory—is to increase effective parenting practices and parent-adolescent communication about sex-related topics to promote healthy decisions and decrease sexual risk taking behavior.

Fitzharris and Werner-Wilson (2004) illustrated how parents significantly influence the perceptions of teenage sexuality. They presented a vast amount of prior research that supported the significance of parental communication (or lack thereof). The authors also outlined three levels of communication about sexuality. The first level was defined as “The Big Talk” and usually included factual, biological information. The second level was labeled “Tea Talks,” which were conversations on topics such as birth control, abortion, and pregnancy. The third level dealt with social issues such as homosexuality, adultery, and rape. In another study mentioned within the article, there were five types of communication styles that had been identified as having been used by mothers: avoidant, reactive, opportunistic, child-initiated, and mutually interactive. It was stated in the article that parents who discuss sexuality with their adolescent child seem to significantly affect the child’s sexual attitudes and behavior. Although communication was a main component of dis-

cussion, barriers were a topic within the article that had great depth. The ongoing conflict of how parents perceive sexuality versus what they teach to their adolescent was discussed. The positive aspect of this study was that the sample included adolescents and their parents, so both perspectives were portrayed. Important findings presented were that adolescents are getting far less communication than they hope for, and the majority of adolescents reported feeling that sexual conversations with their parents were far too opinionated, uncomfortable, and biased. Parents, on the other hand, felt the discussions they had with their children were informing, factual, and safe. Conflicts with the amount of sexual discussion taking place between the parent and the adolescent were very apparent. This was portrayed as the "Rashomon effect," which the researchers describe as a conflict of experience of sexual communication between the parent and adolescent. Further results indicated that sexual communication should occur more frequently and have predetermined goals, steps, and methods.

Miller (2002) studied three different components that influence sexual and contraceptive behavior. These include family structural influences, parent/adolescent relationships, and biological influences. All three of these ideas had significant links to sexual behaviors, including parent/child communication, which relates closest to the topic we wish to study. The article concluded that open, warm and frequent discussion of sexual matters was more likely to delay sexual activity and lower teen pregnancy rates. Contrarily, controlling and invasive parental involvement was found to increase sexual activity and teen pregnancy rates, likely a result of rebellion.

Mueller and Powers (1990) intended to link the style of parents' communication about sexual matters to the behaviors of the recipients. Participants were asked to describe

their parents' communication style from a list of adjectives (e.g. friendly, open, dramatic, etc.) and then describe their own sexual behaviors at different ages. Behavioral questions related to sexual activity, the use of birth control methods, and whether or not they felt comfortable asking their parents questions relating to these topics. In general, the students who described their parents as using a friendly, impression leaving, or attentive approach resulted in higher rates of contraception use and lower rates of sexual activity at an earlier age. Those who described parents' communication style as dramatic, contentious, and open reported higher rates of sexual activity in junior high and lower rates of contraceptive use. The "friendlier" styles may be interpreted as more supportive and thus have a greater impact on sexual behavior than styles interpreted negatively. The negative approaches may also be perceived as controlling, causing adolescents to want to rebel against parental wishes.

Past research has shown that parent-child communication regarding topics of sexuality is of fundamental importance. Thus far the majority of the articles supported the notion that parents have a significant impact on the way adolescents view sex. Fitzharris & Werner-Wilson (2004) reported that by talking about sexuality and risky behaviors, parents give their adolescents the ability and knowledge needed to make safe decisions regarding their sexuality. All the articles reviewed were concerned mainly with adolescents and pre-adolescents. This leaves room for studying college age students, who are more likely to be sexually active than adolescents. Additionally, they may also have formed their own standards for sexual behavior, but still consider the type of communication with their parents about sex related topics (or lack thereof) to have a significant impact on their attitudes towards their own sexuality. We intend to investigate how or if college students' parents' style of communication

about sex related topics influenced their current attitudes and practices in order to better understand the effects of parent communication on this particular group of individuals. The large gap in research on college age students has motivated us to gain further insight on this particular age group.

Theoretical Framework

The question of whether or not parental communication styles about sex related topics has an effect on college students' attitudes about sexually responsible behavior relates directly to the Family Systems Theory (Strong, DeVault, & Cohen, 2008). The Family Systems Theory links sociology and family analysis and explains that one's family weighs strongly on his or her behaviors and feelings. Although this theory does not specifically refer to parent communication styles, it does identify patterns of interaction as having long term effects on an individual's behavior.

In application to the research question, the Family Systems Theory would predict that the communication style of the parent would have a direct effect on an individual college student's attitude about sexually responsible behavior. Based on the Family Systems Theory, it can be predicted that intrafamilial communication has long term effects on an individual's thoughts and behaviors. More specifically, it is believed that individuals with parents who practice an open communication style regarding sexual topics are more apt to be informed and engage in fewer high-risk sexual behaviors compared to those whose parents are avoidant in their approaches to sexual topics.

Purpose Statement

The purpose of this pilot study was to gain insight on how intrafamilial communication affects college students' attitudes about sexually responsible behaviors. The

participants of this study included male and female students at a small Midwestern University ranging in age from 18 to 26. With this information, the researchers will be able to increase the awareness of effective communication of sexually related topics among college age students, researchers, health professionals, parents, counselors, first year experience mentors, and the general public. The central research question in this study was, "Is there a relationship between parent communication styles about sex and college students' attitudes about sexually responsible behavior?" The authors predicted a positive relationship between parental communication styles about sexually related topics and the college student's attitudes about sexually responsible behaviors. This hypothesis is based on review of the current literature as well as the Family Systems Theory, which predicts that intrafamilial communication has effects on individuals' long terms thoughts and behaviors (Strong et al., 2008).

Method

Participants

The site of this study was a small Midwestern university. Participants were $N = 141$ undergraduate students. Three classes were sampled—two general education and one major oriented. There were 80 females in this sample and 61 males. Of the males, 24 were age 18-19, 21 were age 20-21, 15 were age 22 or 23, and one was age 24-25. Of the females, 14 were age 18-19, 35 were age 20-21, 4 were age 22-23, and one was age 24-25.

Research Design

The purpose of this survey research was to be able to generalize from a sample to a similar larger population so that some inferences could be made about some characteristic, attitude, or behavior of the population (Babbie, 1990).

The survey design type was a cross sectional design because it sought to determine the occurrence of attitudes by taking a cross-section of the population that was studied at one point in time. The form of data collection used was a survey that was administered by the authors. The justification for the use of this method was that it enabled the authors to retrieve an equitable amount of male and female responses. This design type was also efficient because it ensured prompt responses and was cost efficient. The population of our study was the university student population; the sample was male and female students primarily in general education classes. This population was easily accessible to the authors. The sampling design was a non-random purposive study because the authors had a purpose in selecting classes from a university online listing that were assumed to have an equitable amount of males and females. The authors did not randomize in order to be inclusive in the classroom. The authors completed the Human Subjects Institutional Review Board (IRB) training in order to address the issue of ethical protection of human subjects; furthermore our study was approved by the IRB.

Data Collection Instrument

To investigate the relationship between parent communication styles and college students' sexually responsible behaviors and attitudes, a survey was designed. The survey instrument included a letter of implied consent which also described the study, defined terms, described risks and benefits of participation, time commitment, confidentiality, contact information of the authors and their supervisor, reinforced voluntary participation, and gave more specific instructions for completing the survey. The authors included two questions concerning demographics—age and gender. Parent communication style was a category used to compare groups. The survey instrument included ten closed-ended

statements based on a five point Likert scale, measuring the intensity of the participants' attitudes ranging from one (strongly disagree) to five (strongly agree). The questions were derived from literature reviews and theory regarding what communication styles were common among families and their consequences. The survey instrument has both face validity and content validity. The face validity of this survey is demonstrated through the logical connection that the survey questions have to the research question. The content validity of this survey is demonstrated through a connection to previous literature and the clear conveyance of the broad nature of the topic. To further ensure that the survey instrument was valid, it was piloted to three undergraduate college students and one university alumni. Their feedback concluded that the survey questions were direct, clear, and appropriately stated.

Procedure

To collect the data for this research, the researchers pre-selected courses from an online course listing at a small Midwestern university which we believed to have an equitable amount of males and females. The authors did not randomize in order to be inclusive in the classroom. The authors contacted the professors of these classes by email, notifying them of our study and research purpose, and asked permission to sample their classes. After hearing back from three professors of various departments, the authors set up meetings with each professor to discuss survey protocol in which we read the survey, answered questions, and explained the procedure of the surveying process. On the day of surveying, the authors arrived at the site fifteen minutes early to set up and answer any final questions from the professor. Once we were given permission to begin, we introduced ourselves and the purpose of our research, stressed the importance of

voluntary participation, informed the students of their right to withdraw or refrain from participating, and read the implied consent portion of the survey. Upon answering questions about the implied consent, specific instructions were given to tear off and keep the implied consent portion of the survey. We explained the format of the survey, informed the participants to select one style of communication they felt their parents used regarding sexual topics, and how to use the Likert Scale on which the rest of the survey was based. Surveys were distributed and a class volunteer was nominated to inform us when all surveys were turned in. The authors then left the classroom with the professor to reduce any potential pressure. Once informed of survey completion, the authors collected the surveys and thanked the class for their participation. Completed surveys were kept in a secure and locked location of one author's home until data analysis.

Data Analysis Plan

The data was cleaned and checked for any missing data. The cleaned surveys were then coded with acronyms for each variable. The demographic variables of age and gender were the first two questions on the survey. The independent variable was parental communication style regarding sexually related topics (STY). The remaining survey statements were the dependent variables and were also given acronyms: to determine if the student felt that they made sexually responsible decisions (RSD), if they are comfortable discussing the use of contraceptives (DIS), if they opposed the use of contraceptives (OPP), if they utilized campus resources advocating safe sex practices (UTI), if their parents frequently discussed sexual matters with them (FDS), if parental sex education was accurate (SACU), if parental education on contraceptives was accurate (CACU), if parents had an impact on sexual decisions of the partici-

pant (IMP), if parents would support the participants use of contraceptives (PSU), and if the participant is comfortable asking the parent questions regarding sexuality (PCOM). The computer program Statistical Package for the Social Sciences (SPSS) was used to analyze the data. The specific level of analysis in this study was the individual. Because we compared groups based on parental communication style regarding sexually related topics, our data analysis included frequencies, cross-tabulations, mean comparisons, as well as a reliability analysis: Chronbach's alpha. Significance testing was not performed because of the nonrandom nature of the pilot study.

Results

The computer program Statistical Package for the Social Sciences (SPSS) was used to analyze the data that was collected. The analyses performed on our variables were frequencies, cross-tabulations, mean comparisons, and a reliability analysis. The first analysis was a frequency distribution which indicated that there was no missing data from our surveys. Upon organizing the collected surveys, the authors found that only two individuals reported forceful communication styles. This small ratio of participants would not have yielded any significant data, so it was decided that these two responses be eliminated. Thus, the focus of the study became open and avoidant communication styles.

Cross-tabulations were performed with the independent variable (STY). For (FDS), (SACU), (CACU), and (PCOM), there was a difference between the groups, with those of open communication style having agreed or strongly disagreed in greater numbers. The variable (DIS) also demonstrated a difference between groups, with those having reported an avoidant communication style disagreeing with the statement. Both groups responded to (UTI) with

large numbers of undecided responses. The dependent variables showing limited or no difference between groups were (RSD), (OPP), and (IMP). For the variable (PSU), there were slightly higher levels of positive responses from those reporting open communication, and higher levels of uncertainty from avoidant respondents.

Table 1
Percent Responses for Survey Item by Parent Communication Style

<i>RSD: I make responsible sexual decisions</i>						
	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree	Total
Open	4.8%	2.9%	6.7%	35.6%	50.0%	100.0%
Avoidant	2.9%	2.9%	8.6%	34.3%	51.3%	100.0%
<i>DIS: I am comfortable with openly discussing the use of contraceptives</i>						
	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree	Total
Open	1.0%	2.9%	11.5%	28.8%	55.8%	100.0%
Avoidant	0.0%	14.3%	14.3%	25.7%	45.7%	100.0%
<i>OPP: I oppose the use of contraceptives</i>						
	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree	Total
Open	72.1%	8.7%	13.5%	1.0%	4.8%	100.0%
Avoidant	77.1%	5.7%	11.4%	0.0%	5.7%	100.0%
<i>UTF: I utilize resources on campus or within the community that advocate safe sex practices</i>						
	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree	Total
Open	19.2%	22.1%	25.0%	18.3%	15.4%	100.0%
Avoidant	17.1%	22.9%	37.1%	8.6%	14.3%	100.0%

FDS: My parents frequently discussed sexual matters with me

	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree	Total
Open	16.3%	33.7%	19.2%	24.0%	6.7%	100.0%
Avoidant	48.6%	34.3%	14.3%	0.0%	2.9%	100.0%

SACU: The information about sex that my parents provided me with was current and accurate

	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree	Total
Open	5.8%	6.7%	25.0%	35.6%	26.9%	100.0%
Avoidant	20.0%	8.6%	40.0%	22.9%	8.6%	100.0%

CACU: The information about contraceptives that my parents provided me with was current and accurate

	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree	Total
Open	4.8%	5.8%	23.1%	33.7%	32.7%	100.0%
Avoidant	22.9%	8.6%	31.4%	31.4%	5.7%	100.0%

IMP: My parents have had an impact on the sexual decisions that I have made

	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree	Total
Open	16.3%	16.3%	20.2%	28.8%	18.3%	100.0%
Avoidant	22.9%	17.1%	20.0%	20.0%	20.0%	100.0%

PSU: My parents would support my choice to use contraceptives

	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree	Total
Open	3.8%	2.9%	9.6%	25.0%	58.7%	100.0%
Avoidant	8.6%	2.9%	17.1%	22.9%	48.6%	100.0%

PCOM: I am comfortable asking my parents questions regarding sexual topics

	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree	Total
Open	10.6%	16.3%	28.8%	24.0%	20.2%	100.0%
Avoidant	37.1%	31.4%	8.6%	11.4%	11.4%	100.0%

Table 2*Descriptive Statistics of Survey Items by Parent Communication Style**RSD: I make responsible sexual decisions*

	Mean	Standard Deviation	Range
Open	4.23	1.04	4.00
Avoidant	4.29	0.96	4.00

DIS: I am comfortable with openly discussing the use of contraceptives

	Mean	Standard Deviation	Range
Open	4.36	0.87	4.00
Avoidant	4.03	1.10	3.00

OPP: I oppose the use of contraceptives

	Mean	Standard Deviation	Range
Open	1.58	1.08	4.00
Avoidant	1.51	1.09	4.00

UTI: I utilize resources on campus or within the community that advocate safe sex practices

	Mean	Standard Deviation	Range
Open	2.88	1.34	4.00
Avoidant	2.80	1.26	4.00

results may be due to a lack of understanding of some of the concepts presented, such as the communication styles and their specific qualities, a reluctance to answer honestly to some of the survey statements (in particular RSD,) as most students would be reluctant to admit to making irresponsible sexual decisions. Finally, participants may not have understood the significance of their honest responses, and that we rely on honesty to examine our data. We will first discuss each dependent variable in relation to the independent variable of Parent Communication Style (STY), if there is a difference between groups, and how findings either concur or disagree with the literature and/or theoretical framework. We will then address the limitations to the study, implications for practitioners, implications for future research, and give our concluding remarks.

Our first statement dealt with the making of responsible sexual decisions. The vast majority of respondents from both avoidant and open communication styles expressed agreement to our statement which did not agree with the literature (Dittus et al., 2004) which found that more avoidant communication yielded higher levels of sexual irresponsibility. In terms of frequent discussion of sexual matters in the home, more respondents from the avoidant communication category acknowledged a lack of communication in their home; this was in correspondence with much of our literature, which all found open communication to include more frequent sexual discussions in the home. Regarding the opposition of contraceptives, there was no major difference between the responses of open or avoidant communication styles. Both communication styles overwhelmingly disagreed with this statement. This topic was not discussed in any literature but was included because contraceptive use is a fundamental part of sexual conversations and protection. The next statement sought information on the utiliza-

tion of campus and community resources (i.e. student health center, Planned Parenthood agencies, etc.) which promote safe sex practices, and interestingly, the responses were overwhelmingly undecided. This was in complete opposition to the literature (Fitzharris & Werner-Wilson, 2004; Miller, 2002) which attributed more open communication styles to frequent contraceptive use and utilization of community resources. When given two statements regarding the accuracy of contraceptive and sexual education that adolescents received from parents, open communicators responded more positively to these statements than their avoidant counterparts. This finding was also supported by our literature (Fitzharris & Werner-Wilson, 2004) which stated that adolescents' perceptions of education regarding sex and contraceptives received from parents are often different from that of the parents (adolescents tend to see their parents as less accurate and meaningful sources of information.) The next statement questioned the impact of parents on participants' sexual decisions. Results indicated that participants who reported avoidant communication styles disagreed slightly more with this statement. The results of this statement neither supported nor opposed the literature as the relationship was weak. Following this was a statement that questioned the prediction of parental support with regard to contraceptive use. Although participants who reported open and avoidant communication styles responded positively to this statement, there were much higher rates of uncertainty in the answers of reported avoidant communication participants. The results of this statement support our literature (Fitzharris & Werner-Wilson, 2004; Miller, 2002) which explained that less frequent communication (avoidant) leaves the child uncertain about their parents' opinions about some sexual matters. The final statement questioned the participant's level of comfort discussing sexual topics with their parents;

participants who reported open styles of communication responded more positively. The results of this final statement supported all of our literature. All of these sources concluded that frequent and open communication about sexual topics will create an environment in which the child is more comfortable asking questions of the parents.

In relation to our theory, the statements regarding the frequency of sexual discussion in the home and parental influence on sexual decision making are specifically related to the Family Systems Theory (Strong et al., 2008). The results show that regardless of communication style, parents had somewhat of an impact on the impressions of parent communication and the sexual decisions made by the participants. Specifically, the theory predicts that patterns of communication, in this case the style of sexual communication, will have long term effects on an individual's feeling and behaviors. Overall, the majority of our questions relate to the Family Systems Theory, but the two aforementioned statements are especially related.

Qualitative Comments

From the qualitative comments provided by our participants, the authors found several interesting patterns. From examining the responses from avoidant communication style participants, two main themes were identified: parental disapproval of sexual decisions and the retrieval of sex information from other sources. In context to the first theme, one statement in particular struck the authors' interest: "I would get judged, thought of differently, but still loved if my parents knew my sexual lifestyles." As the Family Systems Theory predicts, this demonstrates that even at an adult age, there is still parental influence affecting participant's perceptions of their own sexual identity. Research also suggests that children who perceive their parents to be less accepting

of certain sexual behaviors tend to also view their own decisions in a more conservative frame of mind (Fitzharris & Werner-Wilson, 2004).

In context of the second theme: retrieval of sexual information from other sources one participant mentioned getting information "on my own." Another participant mentioned being "well educated by the school about sex and contraceptives" despite the lack of communication in the home. Alternative sources of sex and contraceptive education were not discussed in the literature directly because the literature focused mainly on parent communication. Despite the lack of information in our literature, it is still important to recognize outside sources of information.

The main theme of the qualitative comments from participants who reported open communication styles was a general acceptance and comfort level in discussing sexual topics with their parents. Participants showed gratitude for the ability to talk so openly with their parents. Along with that, there was a general knowledge of the risks associated with unsafe sexual practices. This directly correlates to the research by Mueller and Powers (1990) which found that contraceptive use might be greater when parents communicate information in an open manner and that college students are cognitively ready to accept responsibility for their actions.

Limitations

One of the greatest limitations in our study was that the sample lacked diverse perspectives. The authors surveyed at a small, predominantly white university which could have had an effect on the types of responses that were received. Another limitation to our study was that the sample was not randomized; the authors' initial purpose was to get equitable amounts of males and females which affected the classes

that were selected to be surveyed. The non-randomization was also due to time constraints, the availability of potential participants, and the need to be inclusive in the classroom. A nonrandom pilot study limits us from generalizing to the larger population of students.

Implications for Practitioners

The results from this study suggest that there is a relationship between open communication and positive responses to survey statements. Open communication styles tended to yield more positive results, particularly in terms of the comfort level in discussing sexual matters with parents and peers and accuracy of sexual and contraceptive education. The concept of open education needs to not only be provided to parents, but also to health practitioners and professionals working with this age group. Parents need to be informed about current trends and possibly be better educated on sex themselves in order to comfortably and accurately discuss sexual topics with their child. Frequency of sexual discussion is also a large area of concern; parents must be informed that a discussion happening sporadically or in lieu of an event in their teen's life is a less effective way of communicating. Since our results clearly show that parent education is not a sole factor of decision making, more efforts need to be made to better educate incoming college students about sex and contraceptives. From our findings on resource utilization, it is vitally important that community resources are promoted and better advocated to this particular population. Such efforts might be attained through advertisements and programming.

Implications for Future Research

If this study were to be replicated in the future, a few adjustments should be made to the survey as well as the sam-

pling process. Regarding the survey structure, the statement [OPP] should be omitted from the survey. When omitted, the Chronbach's alpha would increase from .672 to .724. It seemed that this variable had minimal relevance to the other variables perhaps because the opposition to contraceptives does not necessarily have implications about parental communication. Finally, before distributing the survey, it should be ensured that the participants fully understand the concepts about which they will be answering questions. This can be done by reading and providing examples of each of the communication styles, as well as explaining other potentially confusing terms.

Conclusion

As an outcome of this study, it is hoped that open communication styles will be promoted and better understood by parents and practitioners alike. It is also vitally important for professionals, personnel working with college age students, and community resource centers to better educate college students on safe sexual practices in order to prevent unwanted pregnancies, reduce rates of sexually transmitted infections, and increase students' comfort levels in discussing these issues with their sexual partners. It cannot be expected that parents be the sole educators on this topic. In application to the results of this research, students who cited open communication styles in the home reported receiving more accurate information and higher levels of comfort discussing sexual topics not only with parents, but with potential partners. The authors strongly believe that with the work of parents, practitioners and resource centers, a better effort can be made in ensuring education, thus decreasing high risk sexual behavior. As a result of this study, the authors would like there to be action taken by the previously mentioned groups to open the lines of communication

in hopes of decreasing the negative consequences associated with such high risk sexual behaviors.

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Perceptions and Technology Skills of Secondary History Students

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Abstract

The following article discusses the technology skills and perceptions of online classes held by secondary-level United States history students. Based on a survey designed to assess computer software and hardware skills as well as student perceptions of online classes, several recommendations are presented to enhance the success of marketing online classes. The following report has been derived from the results of a recently accepted Master's thesis regarding the implementation of online classes. School districts may find this research useful as a starting point for considering how to implement their own online programs.

Introduction

As secondary-level education begins to implement online classes, it is essential to determine students' technology skill levels and perceptions of online classes. The following article has been derived from the results of a recently accepted Master's thesis in Training and Development at the University of Wisconsin-Stout. Student technology skills and perceptions of online classes are topics of interest as schools develop online classes. The results of the present research will be useful to address potential training needs and

marketing concerns as online classes are implemented.

Literature Review

Several issues impact student perceptions of technology and their technology skills. The first factor that must be considered is the availability of technology. Within poor urban centers, technology may not be easily accessible given the high costs of purchasing and maintaining computer systems (Walker, 1997). Technology is an issue the modern worker must confront successfully in order to advance in the future workplace (Walker, 1997). While availability may be variable within many areas, those within the Millennial Generation (those born after 1982) are uniquely suited for high technology (Strauss, 2005). Many in that generation have experience working successfully with computers and higher technology due to lowering computer costs and greater technology integration in the classroom. Concerns have also been raised about the millenials being overly-focused on technology-based multitasking (Wallis, Cole, Steptoe & Sturmon, 2006).

Online classes are often surrounded by both anxiety and misconceptions. Research has indicated that while online classes often begin with anxiety, many students become comfortable with an online learning platform after basic tasks like signing in to the learning management system and posting discussion responses have been mastered (Hughes & Daykin, 2002). Students new to online classes may also harbor expectations that must be addressed early in order to avoid misunderstandings. Some students may come to class thinking that posting once to a discussion board is acceptable, meeting due dates will not be considered in the final grade, and even that plagiarism is acceptable (Harding & Mainka, n.d.). Students must be made aware that the conventions of an academic environment are the same regardless of format.

Teachers may have to remind students that good grammar is mandatory, online courses can be just as difficult as traditional classes, and that online courses do not mean one can more easily carry a heavier academic load (Harding & Mainka, n.d.).

Perhaps one of the greatest factors impacting student perceptions of technology is teachers. Especially as younger teachers from Generations X and Y begin their careers, students and staff will likely share common experiences and excitement for technology in the classroom. Instructors coming from Generation X, having grown up in the digital age, will be accustomed to digital information sources and computer-based professional development (Baum & Dowling, 2007). The newest teachers from Generation Y (born between 1977 and 1989) will often come to class quite knowledgeable about the educational resources the Internet provides, including news sources and social networking sites (Wong & Wong, 2007). Many students and the newest staff will expect technology integration, which is especially important as the workplace has become more technology oriented. Older teachers coming from the Baby Boom generation will also contribute to students' perceptions of technology as convenient applications like e-mail have been embraced by older teachers (Baum & Dowling, 2007). While the oldest teachers coming from the Traditionalist generation (born between 1930 and 1945) may not hold much enthusiasm for technology, younger staff are part of a growing trend that emphasizes high technology utilization (Baum & Dowling, 2007).

Teachers also contribute to student perceptions and technology skill levels by using the technology to foster excellent learning opportunities. Authentic learning is a growing trend in education, which leads students to create deep understandings based on careful research and approach problems in the same fashion that experts do (Woo, Herrington,

Agostinho & Reeves, 2007). These sorts of assignments are often ideal for technology-based learning experiences and often create excitement for a student seeking to complete authentic work. Tasks with defined goals that offer many methods of completion provide challenges for students to create knowledge in a constructivist oriented manner (Herrington & Reeves, 2003). Such projects, carefully designed and implemented, can enhance both technology skill levels and perceptions of technology.

Method

Participants

Sophomores at Merrill Senior High taking United States History were identified as an ideal group for analysis. U.S. History is the last year-long class students take before they are eligible for completing an online class. U.S. History students provide two years of useful data that can be used to determine the likelihood of online course participation. The sample included several juniors and seniors who were retaking the course, as well as several special education classes. Specific goals of Merrill Senior High are to include students with special needs, and to encourage all students to have an online experience. Of the 306 U.S. History students, 266 were surveyed.

Materials

Resources used to complete the Technology Skills and Perceptions of Online Classes Survey (see Appendix A) included the UW-Stout online survey tool and the Merrill Senior High computer lab. Scale questions were scored using a 5-point Likert scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree).

Design and Procedure

Student technology skill levels and perceptions of online classes were collected using a survey administered in early September 2008. Upon completion of data collection, several important statistics were collected including mean and standard deviation. In order to act upon the data, the following decision table, adapted from (Lee, 2006), was used to interpret the results of the Technology Skills and Perceptions of Online Classes Survey.

Table 1
Decision Table

Mean	Standard Deviation	Rating	Decision
3.5 – 5.0	≤ 1.0	Low	Not a Training/Perception Concern
3.5 – 5.0	> 1.0	Medium	Possible Training/ Perception Concern
1.0 – 3.49	Any	High	Definite Training/Perception Concern

Questions receiving a “Low” rating (“Not a Training/Perception Concern”) will not be pursued further. Those selections with a “Medium” rating will be evaluated depending on the extent of the standard deviation and mean, as well as the importance of the skill or perception to the success of an online class. A “High” rating will be pursued as an issue needing training or a perception needing to be addressed.

Results

The results of the survey have been categorized into hardware and software skills, with the final section focusing on perceptions of online classes (Williams, 2008). Overall, students’ reported technology skill levels were greater than their reported perceptions of online classes. While several questions in the perceptions of online classes section have a high mean, the standard deviation for each question are

greater than 1, reflecting a low consensus rate among students.

Table 2
Descriptive Statistics of Student Hardware Skills

Question	1	2	3	4	5	6	7	8
Mean	3.06	4.33	3.37	3.06	3.75	4.78	4.37	3.00
Standard Deviation	1.41	0.94	1.37	1.37	1.26	0.66	1.00	1.26

Students reported having difficulty identifying components of a computer (#1), keyboarding without looking at the keys (#3), using scanners (#4) and printers (#5) (Williams, 2008). Many also indicate they do not have adequate troubleshooting resources to handle hardware difficulties (#8). While some difficulties do exist, most students can turn on a computer that is unfamiliar to them (#2), use a mouse to select items on a computer screen (#6), and adjust a monitor to reduce glare on the screen (#7).

Table 3
Descriptive Statistics of Student Software Skills

Question	9	10	11	12	13	14	15
Mean	4.58	3.89	4.37	4.53	4.33	4.75	3.08
Standard Deviation	0.77	1.42	1.24	0.84	0.91	0.70	1.30

Students' software skills were generally quite high. While students reported having some difficulty using PowerPoint (#10), e-mail (#11), and face limited resources for troubleshooting software issues (#15), they are comfortable using a word processor to generate reports (#9) and saving files to specific folders (#12) (Williams, 2008). Students are also capable of using search engines to find information (#14), as well as locating files on a computer (#13).

Table 4
Descriptive Statistics of Student Perceptions of Online Classes

Question	16	17	18	19	20	21	22	23	24
Mean	3.72	3.82	3.54	3.81	3.72	3.57	3.54	2.99	3.97
Standard Deviation	1.15	1.52	1.20	1.27	1.32	1.28	1.18	1.36	1.19

Of all the selections, the one relating to making on-line classes a required experience for all students (#23) is the only one that must be addressed according to the decision table (Williams, 2008). Other questions relating to perceptions of online courses had high scores on average, but the standard deviations are large enough to illustrate the disparity of student opinion. Internet accessibility, class scheduling, and the freedom to work at one's pace are generally considered attractive; however, students do not seem uniformly excited about taking an online class.

Discussion

Online classes represent a large change for both teachers and students in terms of teaching and learning. Students, being the most immediate recipients of online courses, must have their abilities and opinions carefully assessed in order to make the best online program possible. The results of the survey indicate students have technology skills with both software and hardware. Most students are comfortable with adjusting a computer monitor to reduce glare, turning on an unfamiliar computer, and using a computer mouse. However, students need training for scanners, printers, basic computer terminology, and access to troubleshooting resources. Without basic hardware support, many students will encounter difficulties with online courses (Williams, 2008).

Of all areas surveyed, students showed the greatest aptitude with software. Students have difficulties with e-

mail access and PowerPoint, but are able to effectively write a report on a computer and retrieve & save files to a specific folder. Furthermore, while students have difficulty knowing the parts of a computer, their knowledge is highly functional. Just as a mechanic can change oil but not know fluid dynamics, students know how to Google, but may not be able to point out the central processing unit.

Perhaps the most important part of the survey and certainly the most fascinating is the controversial nature of online courses (Williams, 2008). Students are definitely interested in online courses, as demonstrated by the nearly universally high averages for each question. The problem facing the implementation of online classes is a minority of students who likely have some anxiety about online experiences. Taking advantage of the native technology ability of students to demonstrate that most already have the skills needed to take an online course would be advisable.

The results presented here have several important limitations, but do provide direction for the implementation of online courses. The results of the survey are useful for a high school developing an online program as technology skills and perceptions of online classes were measured; however, the research does not clarify how teaching or learning happens in an online class. Secondly, the results of this survey are most relevant for secondary level social study classes and other measures may be needed to assess the abilities and perceptions of students and staff in other areas. With these limitations understood, the survey can be used to determine the skills students and staff may need to develop and the marketing concerns involved in implementing an online course.

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Appendix A

Technology Skills & Perceptions of Online Classes

Using the following scale, please complete the following questions. The results of the survey will be used to help determine the training needs and perceptions of online classes that may need to be addressed as Merrill Senior High School considers the implementation of online courses. Your participation is highly appreciated! 1 Strongly Disagree, 2 Disagree, 3 Unsure, 4 Agree, 5 Strongly Agree.

1. Given a computer, I could point to the central processing unit.

Select One: 1 2 3 4 5

2. I can turn on a computer that is unfamiliar to me.

Turning on a computer requires turning on the monitor as well as the central processing unit.

Select One: 1 2 3 4 5

3. When typing I don't need to look at the keyboard.

Select One: 1 2 3 4 5

4. I can use a scanner to create a digital image.

Select One: 1 2 3 4 5

5. I can use a printer to make a paper copy of digital information.

Select One: 1 2 3 4 5

6. I can use a mouse to select items on a computer screen.

Select One: 1 2 3 4 5

7. I can adjust the computer monitor to the appropriate height to reduce glare on the screen.

Select One: 1 2 3 4 5

8. If I have trouble with a piece of hardware, I have access to troubleshooting resources to resolve the issue.

Technical support phone numbers and technical manuals are both troubleshooting resources.

Select One: 1 2 3 4 5

9. I can use a word processor to write a paper.

Select One: 1 2 3 4 5

10. I have created presentations using software like Microsoft PowerPoint using my computer at home.

Select One: 1 2 3 4 5

11. I know how to access my email account.

Select One: 1 2 3 4 5

12. I can save files to a specific folder on a computer.

Select One: 1 2 3 4 5

13. I can find a file I am looking for on a computer.

Select One: 1 2 3 4 5

14. I have used a search engine like Google to find information.

Select One: 1 2 3 4 5

15. I have access to troubleshooting resources if I have problems with software. Technical support phone numbers and technical manuals are both troubleshooting resources.

Select One: 1 2 3 4 5

16. If I were given the resources to complete class activities, I would not need the physical presence of a teacher. You would still be able to ask questions and advice from your teacher.

Select One: 1 2 3 4 5

17. I have a computer at home with dependable Internet access.

Select One: 1 2 3 4 5

18. I can learn just as much online as in a traditional class.

Select One: 1 2 3 4 5

19. Having the freedom to work at my own pace would encourage me to take an online class.

Select One: 1 2 3 4 5

20. I would take an online class in order to reduce scheduling conflicts with other classes.

Select One: 1 2 3 4 5

21. I would take an online course if I was given the opportunity.

Select One: 1 2 3 4 5

22. Taking an online course would help me prepare for college.

Select One: 1 2 3 4 5

23. Taking an online course should be a required experience for all students of Merrill Senior High.

Select One: 1 2 3 4 5

24. If I were to take an online course I have dependable Internet access at school.

Select One: 1 2 3 4 5

Visible Body Modification in Hiring Practices

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Keywords: Visible Body Modification, Discrimination, Hiring practices

Abstract

Due to increasing competition for jobs, employers are able to select from a large pool of candidates. A tattooed person may experience negative social consequences, including negative perceptions because of tattoos and piercings (Resenhoeft, Villa, & Wiseman, 2008). The research question was, "What are the attitudes of human service professionals regarding body modification in hiring practices?" The authors hypothesized professional attitudes would adversely affect the ability of a person with visible body modification (VBM) to find employment. The site of the nonrandom pilot study was in a small Midwestern town. Participants were $N = 16$ professionals in the human services professions. Survey data was statistically analyzed using frequencies, mean comparisons, and a reliability analysis, but findings did not support the hypothesis. Human service professionals responded that within parameters, individuals with VBM would not be discriminated against. Family study practitioners need to increase awareness that commonly held stereotypes are inaccurate. It is recommended that future research include a larger and more diverse sample to generalize to the attitudes of professionals in other fields.

*Society feels sympathy for those who wear
their hearts on their sleeves, but for those
who wear their hearts on their arms in the
medium of ink, society may feel anything but
sympathy*

~anonymous

Introduction

In these times of economic uncertainty and increased competition for jobs, employers are able to pick and choose from an ever-growing pool of candidates. One of the common attributes an employer may consider is grooming. According to Foster and Hummel (2000, p. 1), "Physical appearance, as expression of identity, is modified in ways that are regarded as routine and normative; examples include shaving; cosmetics; waxing/electrolysis; hair styling...or extreme and disvalued examples including tattooing; piercing; scarification; branding; body sculpting, such as feet binding or implanting". Tattoos and piercings that can be viewed or are on typically exposed areas of the body are known as Visible Body Modification (VBM) (Swanger, 2006). The physical risks of tattoos have been well-established, however, a tattooed person also may experience negative social consequences, including negative perceptions formed toward that person because of the tattoo (Resenhoeft, Villa, & Wiseman, 2008). Is there a discriminating attitude regarding visible body modification and hiring practices? The authors reviewed the literature and concluded that there was a gap of knowledge regarding information on how VBM affects employers' attitudes toward candidates being interviewed for employment. Human services professionals were surveyed regarding their attitudes about hiring individuals with visible body modification and whether the VBM would affect their hiring decision.

Literature Review

The majority of reviewed literature dealt with discrimination related to obesity and racism, with VBM and discrimination appearing for discussion mainly in the legal arena. Many companies do not have specifically-stated policies regarding VBM. There is an overabundance of information on differing attitudes and opinions directed toward those with body art. Most of the information is biased in either direction without any scholarly base. The studies have shown that people in society react differently to those individuals who have visible body modification. There is an underlying association between VBM and the stereotype of individuals being deviant from the cultural norm, less educated, and of lower intellectual ability. Professionals in the health care field treated modified people in a less caring manner that affected the quality of care given.

Rosenhoeft, Villa, and Wiseman (2008) found that individuals with tattoos can be viewed and classified in an unsavory and harmful way by members of the current social order. Women with large evident tattoos in particular seemed to suffer the most harm when viewed by student participants. Students, divided into control groups and variable groups, were asked to rate physical and personal characteristics of two models. The model seen with an aggressive animal appearing on her arm was reported as possessing considerably more undesirable physical and personal attributes than the same model without a tattoo. In a subsequent experiment, a model without a tattoo was compared to the same model with a smaller and more innocuous tattoo. The results pointed to greater acceptance of the model with the tattoo.

Swanger (2006) attempted to design an acceptable grooming standards instruction booklet to clarify grooming at the worksite. The interview process generally involves a strict adherence to conservative professionalism when in-

interviewing candidates for employment. The study suggests that individuals should have a better understanding regarding companies' view on VBM. This could include how many earrings may be worn per ear, and whether any visible tattoos need to be covered up.

Foster and Humel (2000) believe that VBM is just another aspect of self-expression, when it has historically been associated with negative stereotypes. Individuals with body modification received a label as self-indulgent, abnormal, and coming from a poor socio-economic background with lower intelligence and little educational achievement. To refute the latter suggestion, some of today's youth are continuing on to gain higher levels of education and obtaining piercings and tattoo procedures. This study suggests that attitudes toward VBM are becoming more acceptable in the current culture, and it is now viewed as just another way of expressing one's self. According to Pitts (2000), Radical Body Modification (RBM) has also become more prevalent, available, and tolerated in the last ten years.

Struppy, Armstrong, and Casals-Ariet (1998) revealed that in previous studies, individuals with visible body modification were viewed as pariahs by health care workers in a society that perceived them as anti-establishment and therefore undesirable as patients and members of the current culture. It can be supposed that this attitude affects not only the care an individual receives, but is also transferred to others in the health care field. In the past, juveniles with VBM were considered delinquents from poor families, while current evidence points to the fact that the younger generation with visible body modification may be academically successful learners. The authors intimate that although prejudicial attitudes continue in the healthcare field and other professional areas, with education and information these views can be altered so VBM individuals are perceived and provided

with more effective and compassionate care. Specter (1991) believes that when professionals realize the prejudicial attitudes they carry into the field, they will modify their attitudes and become more accommodating to those with VBM.

There are many articles expressing thoughts on this topic, but little definitive research has been completed on the subject of body modification in employment opportunities. There seemed to be a large gap of general knowledge that specifically targets the discrimination encountered by individuals with visible body modification in hiring practices. We found many articles from the judicial community relating to cases of discrimination and company policies, but little concerning the current hiring practices followed. We hope to advance the family social science literature by contributing knowledge that will lessen the discriminatory practices directed at those with visible body modification.

Theoretical Framework

This study is informed by the theory of Symbolic Interaction (Strong, DeVault, & Cohen, 2005). Symbolic interaction explores how people experience each other, how they react to each other, and what types of judgment they form about those with whom they are in contact. This theory also looks at interpretation of a person's actions and meaning based on the information that has been gathered through social constructs, personal experiences, and sense of self.

As applied to this study, when people in a society interact, they may draw conclusions about those with whom they interact based on physical characteristics. According to this theory, there may be an adverse reaction from a human services professional who is interviewing potential employees and the candidate who presents himself or herself with body modifications. This reaction may also be affected by the age and gender of the hiring professional and the type of

agency. The symbolic interaction theory would predict that equally qualified candidates may be discriminated against because of body modifications.

Purpose Statement

The purpose of the present study was to explore the attitudes of human service professionals regarding hiring practices of individuals with visible tattoos and piercings. We hope to advance the family social science literature by contributing knowledge that will lessen the discriminatory practices directed at those with visible body modification. The central research question was, "What are the attitudes of human service professionals regarding body modification in hiring practices?" According to the literature, we hypothesized that professional attitudes will adversely affect the ability of a person with visible body modifications to find employment.

Method

Participants

The sites of this study were two small Midwestern towns. Participants were $N = 16$ (four male and twelve female) professionals in the human service professions. Of those professions, one was for-profit and 15 were non-profit. Five participants were under the age of 30, one was between the ages of 31 and 36, four were between the ages of 37 and 42, and six participants were age 49 or above.

Research Design

The purpose of this research was to identify current attitudes from our sample population and then use that data to generalize about a population of similar professionals in the field of human services. The survey design was cross-sectional, meaning we surveyed attitudes of human service

professionals at one point in time. The form of data collection was self-administered questionnaires. The rationale for using this method was that it was the most efficient method to gather data directly in small towns due to the fast pace of our research course, convenience, low cost, and the quick return of data. Our population was human service professionals in both for-profit and non-profit agencies; our sample was composed of male and female professionals located in two different Midwestern towns. The study used a non-random purposive design because our purpose was to gather information from professionals in the human service field. We used nonrandom sampling in order to fulfill our sample target number in a short period of time. The ethical protection of human subjects was provided by completing the Human Subjects Institutional Review Board (IRB) training; our study was approved by the IRB.

Data Collection Instrument

In order to address the attitudes of human service professionals regarding hiring individuals with VBM, a survey was designed. The survey included a cover letter with an implied consent form which included a description of the study, definition of any terms not commonly known, risks and benefits, time commitment, confidentiality, voluntary participation, and contact information of the research team and the supervisor, as well as instructions for completing the survey.

The survey consisted of three demographic questions relating to age, gender, and agency status (profit versus non-profit.) Participants were then given eight closed-ended statements based on a 5-point Likert scale which measured the intensity of the respondents' attitudes ranging from one (strongly disagree) to five (strongly agree). Questions were informed by our literature and theory regarding what factors

relate to attitudes regarding hiring individuals with VBM.

The survey instrument has both face validity and content validity. Face validity was obtained by logically connecting the concept explored with the survey research questionnaire. Because the questions and concepts addressed in the survey were literature-inspired, it was determined that there was a connection between the attitudes of human service professionals, hiring practices and individuals with VBM. Content validity was obtained by covering a breadth of concepts on the survey instrument having to do with hiring individuals with VBM. To increase validity, the survey was piloted to three individuals on a college campus who confirmed that the terms and concepts were clear and understandable. Feedback indicated that the survey was clear and ready for distribution.

Procedure

To collect the data for this study, we approached human service professionals in two small Midwestern towns between October 22, 2008 and November 10, 2008. Our purposive sampling design started with using the yellow pages for the two local communities. We selected agencies that were involved in the human service field. We gathered phone numbers and called to collect e-mail addresses of the individuals responsible for hiring new employees. We then sent out e-mails proposing our survey. We then made follow-up phone calls immediately to those who responded in a positive manner, and scheduled appointments for survey participation. Those who did not respond to the initial e-mail were called a week later to confirm having received it and asked if they were interested in participating in the survey. At the appointment time, the participants were read the implied consent form and instructed to keep the two top sheets for their records. The researcher then instructed the

participant to place the completed survey in the envelope provided. The researcher stepped out of the room in order to let the participant complete the survey privately. Completed surveys were placed in a locked compartment at one of the researchers' homes for security.

Data Analysis Plan

The data were first cleaned and checked for any missing data. One survey had missing data and was removed. The cleaned surveys were then coded using acronyms for each variable. The first three items on the survey were demographic variables: age (AGE), profit/nonprofit (TYP), and gender (GEN). Each survey statement was a dependent variable and given an acronym name: "I would hire an individual with visible tattoos" (VIT), "I would hire an individual with visible piercings" (VIP), "People who have body modification have an increased chance of being mentally ill" (MIL), "People with body modification are socially abnormal" (SAB), "People with body modification are usually low-income" (LIC), "People with body modification are usually lesbian, gay, bisexual, or transgendered" (LBG), "People with body modification are more likely to commit crimes" (CCS), "I would give equal consideration to an equally qualified person with VBM" (EQO). To analyze the data, the computer program Statistical Package for the Social Sciences (SPSS) was used. The individual was used as our level of analysis. Data analyses included frequencies, mean comparisons, and Chronbach's alpha reliability measurement. Significance testing was not performed due to the small and nonrandom pilot study sample.

Results

All of our variables were subjected to frequency distribution analysis. The majority of respondents disagreed and/or strongly disagreed that people with VBM had an increased chance of being mentally ill, are socially abnormal, are low income, are lesbian- gay- bisexual- transgendered, or more likely to commit crimes. Respondents were undecided whether they would hire an individual with visible tattoos or would give equal opportunity to a person with VBM, and agreed and/or strongly agreed they would hire an individual with visible piercing.

A reliability analysis was run to indicate if our variables were a reliable index to measure our major concept—attitudes towards hiring an individual with body modification. Cronbach's alpha was computed to be 0.522. This value would increase to .586 if the survey question "I would give equal opportunity to individuals with VBM" was dropped from the survey.

Table 1
Frequency Distribution of Survey Items

Survey Item	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree	Total
<i>VTT</i> : I would hire an individual with visible tattoos	0.0%	6.2%	43.8%	25.0%	25.0%	100.0%
<i>VTP</i> : I would hire an individual with visible piercings	0.0%	6.2%	31.2%	37.5%	25.0%	100.0%
<i>MII</i> : People with body modification have an increased chance of being mentally ill	81.2%	6.2%	0.0%	6.2%	6.2%	100.0%
<i>SAB</i> : People with body modification are socially abnormal	75.0%	12.5%	0.0%	12.5%	0.0%	100.0%
<i>LIC</i> : People with body modification are low income	68.8%	25.0%	6.2%	0.0%	0.0%	100.0%
<i>LBG</i> : People with body modification are lesbian, gay, bisexual or transgendered	75.0%	25.0%	0.0%	0.0%	0.0%	100.0%
<i>CCS</i> : People with body modification are more likely to commit crimes	68.8%	25.0%	0.0%	6.2%	0.0%	100.0%
<i>EQO</i> : I would give equal opportunity to a person with visible body modification	0.0%	0.0%	37.5%	31.2%	31.2%	100.0%

Table 2
Descriptive Statistics of Survey Items

Survey Item	Mean	Standard Deviation	Range
VIT: I would hire an individual with visible tattoos	3.69	0.95	3.0
VIP: I would hire an individual with visible piercings	3.81	0.91	3.0
MIL: People with body modification have an increased chance of being mentally ill	1.50	1.21	4.0
SAB: People with body modification are socially abnormal	1.50	1.03	3.0
LIC: People with body modification are low income	1.38	0.62	2.0
LBG: People with body modification are lesbian, gay, bisexual or transgendered	1.25	0.45	1.0
CCS: People with body modification are more likely to commit crimes	1.44	0.81	3.0
EQO: I would give equal opportunity to a person with visible body modification	3.94	0.85	2.0

Discussion

Our hypothesis—that professional attitudes would adversely affect the ability of a person with visible body modification to find employment—was not supported by the results. Professionals in the human services field did not exhibit the predicted attitudes that would hinder people with VBM from gaining employment with their respective agencies. There was a caveat, however. We will discuss each dependant variable in terms of how the results either agreed or disagreed with our hypothesis and also review the qualitative comments. We will then discuss the limitations to the study, the implication for practitioner, and implications for

future research.

Our results showed that most respondents disagreed with the statement "People with VBM have an increased chance of being mentally ill." We interviewed individuals in the human services field who were responsible for hiring new employees for their respective agencies. They disagreed that VBM had correspondence as an indicator of mental illness as stated in Struppy et al. (1998, p.1166), "finding tattoos on a patient indicates...psychiatric disturbance". The majority of our respondents disagreed that people with VBM are socially abnormal, as stated by Foster and Hummel (2000), that cast body modification as "deviant." It has become commonplace for professionals to encounter an individual with VBM. According to Swanger (2006, p.76), "The interview process generally involves a strict adherence to conservative professionalism when interviewing candidates for employment". The majority of our respondents were undecided when given the statement "I would hire an individual with visible tattoos." According to one respondent, "based on the type of position and population the individual with VBM would be hired for, visible tattoos may not be appropriate to meet the criteria necessary for client comfort." Survey respondents strongly disagreed that people with body modification are low income. This does not correspond with the literature (Struppy et al., 1998, p.1166), which states stating that "In the past juveniles with VBM were considered delinquents from poor families..." Our next statement was, "I would hire an individual with visible piercing." Interestingly, participants responded between agreed and undecided. According to the participants' general consensus, hiring an individual with many visible piercings located in various positions on or around the face would be based on the employment position applied for and the population with which the candidate would be interacting. The preponder-

ance of responses with the statement, "People with body modification are lesbian, gay, bisexual or transgendered" fell into the strongly disagree category. The human service professionals we surveyed do not hold this stereotype found in the literature as factual. According to Foster and Hummel (2000, p.3), "Tattoos and piercings, as with other forms of body modification, have (had) association with marginalized groups, emphasizing the oppositions of self/other, modern/primitive, gay/straight...". The survey statement "People with body modification are more likely to commit crimes" was received with ratings of strongly disagree, which does not correspond with the literature from Foster and Hummel (2000, p.2), which implied "correlations between body modification and stigma. Some research casts such practices as...associated with criminality". When presented with the statement "I would give equal opportunity to a person with VBM," the majority responded "undecided." The qualitative comments received stressed the importance of qualifications for the position and the skills shown in the interview regardless of the individual's status with VBM. However, employment was also dependent upon the position applied for based on the population encountered in the position.

This study is informed by the theory of Symbolic Interaction (Strong et al. 2005), which explores how people experience each other, how they react to each other, and what types of judgments they form about who they are in contact with. As applied to this study, when people in a society interact, they may draw conclusions about those they interact with based on physical characteristics. According to this theory, there may be an adverse relationship/reaction between a human services professional who is interviewing potential employees and the interviewee who presents himself or herself with visible body modifications. The Symbolic Interaction theory would predict that equally qualified candidates

may be discriminated against because of body modifications. The overall personal attitude of human service professionals was one of acceptance in regard to individuals with VBM, although from a business perspective human service professionals needed to safeguard their ability to serve a specific population which may not be as accepting of individuals with VBM. This regard for a client's comfort made some human service professionals consider limiting individuals with VBM to certain positions within their agency. Due to this concern, they are not always able to give equal consideration to with people with VBM.

Limitations

We had a small sample size and we were unable to randomize the survey collection due to time constraints and number of available participants who fell within our sampling parameters. Significance testing was not performed due to our study being a small nonrandom pilot.

Implication for Practitioners

We found that the majority of human service professionals who are responsible for hiring decisions do not personally hold discriminatory stereotypes and would not have any qualms in hiring an individual with VBM if it were not for the consideration they must make to those they serve. Family study practitioners need to increase awareness that many commonly held stereotypes are incorrect and discriminatory. This increased awareness can be discussed with professionals in other fields. The results showed there is a need to inform society that previously held beliefs, as applied to individuals with VBM, are stereotypes that are inaccurate.

Implications for Future Research

We would recommend that the next step of research be to use a larger and more diverse sample to be able to generalize the attitudes of professionals in other fields. We would recommend that respondents be able to comment on each statement directly after the Likert scale rating has been recorded. We believe it would be more valid to segregate professionals' personal thoughts regarding body modification and the grooming standards that a particular position or agency may require. We considered eliminating the statement "I would give equal opportunity to a person with VBM". This would increase the Cronbach's alpha measurement from .522 to .586. It would also be possible to reword the statement to "I would give equal opportunity to a person with VBM depending on the position applied for".

Conclusion

This subject is important to the family studies field because of the discrimination that may occur to those with visible body modification. Although we found that most human service professionals were personally very accepting of VBM, they must still give special consideration to the clients they serve. The most qualified candidates for a position may be overlooked based on their personal appearance. This may result in a lower quality of care or service. It is our hope that this information can be spread to other professionals in different fields and eventually into the greater society.

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Efficacy of Household Agents in the Removal of *E. coli* from Produce

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Keywords: Washing, Technique, Inoculated, Uninoculated, Economical, *E. Coli*, Bacteria

Abstract

Common household chemicals may provide a safe and inexpensive option for use as agents to wash fresh produce and reduce the population of foodborne pathogens such as *E. coli*. A comparison of the efficacy of two household agents on the reduction in *E. coli* population is reported here. A 0.01% concentration of bleach solution and a 5.00% acetic acid solution were used as washing agents on spinach and tomatoes that had been inoculated with *E. coli*. Comparisons of total *E. coli* and total aerobic bacteria following various washing techniques were made. Spinach treated with bleach or acetic acid produced little to no reduction of total bacteria in the population. Tomatoes treated with acetic acid showed a 30-95% reduction in total aerobic bacteria, while tomatoes treated with bleach showed no growth of bacteria following a 48 hour incubation period. Future work will investigate the use of a genetically modified *E. coli* isolate as an inoculum source to more effectively and efficiently distinguish *E. coli* from total aerobic bacteria.

Introduction

Most strains of the bacteria *Escherichia coli* are harmless. Some strains can make humans very sick, causing a wide array of symptoms such as urinary tract infection, respiratory illness, diarrhea and others. *E. coli* causes disease in humans by making toxins, referred to as shiga toxins (or STEC); the most common and most frequently reported in the media is *E. coli* O157:H7 ("*Escherichia coli*," 2008). The negative effects of this strain contribute to recent consumer insecurities to purchase fresh produce such as spinach. According to the center for disease control and prevention (CDC), the *E. coli* outbreak of 2006 affected 26 states with reports of 95 people hospitalized, 29 developing hemolytic uremic syndrome (HUS) and at least one death. The sources of spinach came from Utah, New Mexico and Pennsylvania (MMRW, 2006). The effects of *E. coli* outbreaks are of serious concern for individuals with compromised immune systems such as children, the elderly and pregnant women.

Although eliminating or reducing fresh produce from the Western diet would reduce the incidence of *E. coli* infection, it would be detrimental to the health of the population due to factors such as nutrient loss during food processing (Schroeder, 1971). Fresh produce also provides distinct flavor, texture, crispness, and mouth feel unique to a given food item. Cooking, canning, and other methods of processing eliminate a large majority of foodborne pathogens, but only to sacrifice taste, texture, nutrition and other properties of food. Therefore, a need persists in the fresh-food industry for practices beyond standard water rinsing, to safeguard the fresh produce industry. Economical value is also a growing concern for washing technique. Fit™ spray is a product available in supermarkets and contains a variety of ingredients including citric acid, baking soda, ethyl alcohol, oleic acid, and glycerol. A gallon of that product will cost

\$30 or more, with a per-use of a few milliliters for spraying produce to ½ cup per gallon of water for soaking methods (Fit FAQs, 2009). A gallon of bleach can cost between two and three dollars, and a gallon of 5% acetic acid, or vinegar, costs about five dollars. Bleach, the most economical of the three, is further diluted when used directly on food. According to federal regulations, utilizing household bleach at a concentration of 100 parts per million (0.01%), or approximately one tablespoon per gallon of water, on food and food surfaces is the maximum amount recommended (McGlynn, n.d.). Contact with food or other surface is recommended for one to five minutes to ensure sufficient sterilization (McGlynn, n.d.).

Acetic acid is used in products such as pickles and ketchup to prevent bacterial growth from occurring (Dauthy, 1995). Dr. Carol Seaborn (personal communication November 12, 2008) emphasized research in a controlled laboratory study reporting more effective anti-microbial results from using organic acid treatment on *Salmonella enterica* combined with additional water rinses, drying, and agitation procedures on apples, versus water washing alone.

The objective of the present research was to determine the effectiveness of the common household chemicals bleach and vinegar as washing agents to remove bacteria from inoculated tomatoes and spinach. It was hypothesized that using either acetic acid or bleach solutions in place of water alone will provide sufficient anti-microbial protection and eliminate growth of *E. coli* and other harmful bacteria.

Method

Materials

Fresh Produce Sources: Commercially available washed and bagged spinach leaves and boxed grape tomatoes were purchased at a local grocer and refrigerated at 4°C

for 12 hours before use.

E. coli Inoculum: Sterile 3ml culture tubes of nutrient broth media were inoculated with $\sim 10\mu\text{l}$ of *E. coli* and were incubated overnight at 37°C . McFarland standards were used to visually approximate the concentration of cells in suspension. The McFarland scale represents the specific concentrations of Colony Forming Units (CFU); the amounts used in ratio to make a 0.5 standard are Barium Chloride (BaCl_2) to Sulfuric Acid (H_2SO_4) is .05 to 9.95 (Sutton, 2006). Once the *E. coli* mixture was consistent with the McFarland standard, the cell density approximated 10^6 CFU/mL.

Media: Samples were cultured on Luria Agar with and without ampicillin.

Design

This research was executed by students in an undergraduate microbiology class at the University of Wisconsin-Stout, who performed the *E. coli* inoculation of the produce and washing with appropriate chemical agent. Two class sections were assigned to different washing techniques (either bleach or acetic acid) and different fresh produce (either tomato or spinach). Both uninoculated (control) and inoculated (experimental) controls were included in the study.

Procedure

Samples were inoculated to establish consistent inoculum to produce ratios. For spinach, 0.5 g of fresh produce was used with $500\mu\text{L}$ of *E. coli* inoculum. For the tomato, 10 g of fresh produce was inoculated with 1mL of *E. coli*. For the both the spinach and tomato control groups, 1 mL of sterile distilled water was used per 10 g of sample. Weighed produce samples were placed in sterile stomacher bags and inoculated with either *E. coli* (experimental) or water (control). Following inoculation, the bags were placed on a hard

surface in an upright position for 20 minutes. After the adhering time, 10 mL of assigned wash solution (either acetic acid or bleach) was added to each bag. Solution was gently rubbed, decanted, and rinsed three times for 30 seconds each time, with 10 mL quantities of sterile water.

Following the rinsing procedure, each sample was placed into separate, sterile stomacher bags. After adding 10 mL of sterile water to each of the samples, bags were manually agitated and rubbed thoroughly, without tearing or puncturing the external surface of the sample. After 10 minutes of agitation, 1 mL of sample was removed from each stomacher bag with a pipette, directly onto separate lb/amp plates. The solution was spread with a sterile bent glass rod. Plates were labeled and placed for 48 hours into a 37°C incubator.

Results

Bacterial growth was measured in values of 0-10; 0 representing no growth on the agar plate and 10 representing 100% plate growth coverage. The serial dilution controls, with the uninoculated sample (taken directly from the ready-to eat package), covered 50% of the plate surface from the tomato, and 80% growth from the spinach. The inoculated samples for both the tomato and spinach each had 80% growth using the sterile water serial dilution method.

One spinach group receiving the acetic acid treatment had 100% growth in both the control and treatment groups. The second spinach group had 70% growth on the uninoculated plate and 90% growth on the plate inoculated with *E. coli*.

One bleach treatment group showed 100% growth on the both the inoculated and uninoculated plates; the second bleach treatment group covered 90% of the uninoculated plate and 100% coverage on the plate inoculated with

E. coli.

The first control group, which used the tomato treated with acetic acid, produced 50% growth on the uninoculated plate and 70% growth on the inoculated plate. The second treatment group covered 5% of both the uninoculated and inoculated plates.

Both tomato bleach treatment groups showed no growth for both inoculated and uninoculated plates. See Tables 1 through 3 for condensed descriptions of the results.

Table 1*General Bacterial Growth on Agar Plates for Two Washing Treatments—Class Results*

Tomato—Acetic Acid	Tomato—Bleach
Group 1	Group 1
Uninoculated 50%	Uninoculated 0%
Inoculated 70%	Inoculated 0%
Group 2	Group 2
Uninoculated 5%	Uninoculated 5%
Inoculated 5%	Inoculated 0%

Table 2*General Bacterial Growth on Agar Plates for Serial Dilution Control—Class Results*

Spinach—Acetic Acid	Spinach—Bleach
Group 1	Group 1
Uninoculated 100%	Uninoculated 100%
Inoculated 100%	Inoculated 100%
Group 2	Group 2
Uninoculated 70%	Uninoculated 90%
Inoculated 90%	Inoculated 100%

Table 3
General Bacterial Growth—Authors' Results

Spinach	Tomato
Uninoculated 80%	Uninoculated 50%
Inoculated 80%	Inoculated 80%

Discussion

The growth percentages represent *E. coli* and other bacterial growth; due to the tremendous amount of variable bacterial colonies, all growth was included in the study. Due to insufficient time, gram stains were unable to be performed on individual colonies. Future research will focus on the use of genetically modified *E. coli* that is more easily distinguishable from the general bacterial population.

Both the bleach and acetic acid treatment groups for the spinach had greater rates of general bacterial growth on the plates inoculated with *E. coli* than the plates not inoculated. This result was expected due to the addition of bacteria. In the Tomato groups, however, only one acetic acid group showed this relationship, while the other groups had 5% or less growth on inoculated and uninoculated plates, with the bleach group completely clear of any colony growth. These results support the hypothesis that bleach and acetic acid treatments function as anti-microbial agents; however, the inconsistencies between the tomato and spinach groups leave room for speculation on possible differences between spinach and tomatoes. In the study performed on the *E. coli* outbreaks of Utah and New Mexico in 2006, Grant et al. (2008) explained that *E. coli* adherence to spinach surfaces can occur by internalization of the plant structure by entrance through the roots of the plant and adherence is more likely to occur on cut surfaces, such as pre-packaged containers. Therefore, excessive bacterial growth on the spinach can be

explained by textural and structural differences between the produce.

This study may have benefitted from a third group measure of water-only rinsing. Including this step could explain the discrepancy between the inoculated and uninoculated groups. Vegetables in pre-packaged containers are assumed "ready to eat," and an additional water rinsing step may have produced similar effects as the wash treatments. Therefore, by incorporating another group including a comparison to water wash could provide a more thorough comparison of traditional household washing.

An interesting finding in this study was the similarity of colony growth on the inoculated and uninoculated plates for spinach with both washing treatments. It is possible that bacterial growth increases from food taken directly out of the package and eaten without any washing. In other words, high levels of bacterial growth already present on the produce may have interfered with additionally added *E. coli*, and may even promote the bacterial growth population upon inoculation. It is possible that the impact of the treatment was actually reduced, but due to the high amount of bacteria already present on the spinach, no effects were detectable from the treatment.

Using tomatoes in the study of *E. coli* growth may also have an impact on the results of this study. Historically, tomatoes have been infected with *Salmonella* rather than *E. coli*. This factor may be related to some individual differences between the two vegetables. Further research could investigate the impact of *Salmonella* inoculations with each of the washing treatments, to see if the treatments have the same effectiveness on a more "predisposed" produce. Another interesting component regarding the contamination of tomatoes is the link primarily to recurrent outbreaks of the same growing regions (MMWR Weekly, 2007).

Further research could focus specifically on *E. coli* growth by using transformed bacteria and ampicillin as a selective media. This media should also contain the sugar arabinose, which causes transformed bacteria to glow under UV light. This mechanism is enabled by the Green Fluorescent Protein (GFP) gene ("PGlo transformation," n. d.). By placing the inoculated plate under ultraviolet light, a researcher can easily isolate the growth of the *E. coli* inoculated in the sample regardless of bacterial growth amount. This method could also aid in measuring the fastidiousness of *E. coli* on different types of produce.

There are many factors which can contribute to the effectiveness of antimicrobial agents: population size—larger populations are more persistent than smaller ones, the presence of resistant endospores, the concentration of the agent, duration of exposure to agent, temperature, environment, biofilm production, and heat and acidity. It is also important to consider the type of pathogen the anti-microbial agent is being used for. Bacteria have different adaptation capabilities which impact the ease of eliminating the pathogen.

In the United States, the increasing number of outbreaks of pathogenic infections poses concern for food safety, and illustrates the need for safe, effective, and inexpensive washing techniques to prevent human infection during consumption of fresh produce. Current regulations of use for household bleach as an antimicrobial agent have been shown to be safe and effective when standards are followed; but perhaps society is in need of more universal practice to prevent infection outbreaks, and to assume all produce contains pathogenic microorganisms. Future research could further define factors enabling pathogenic spread and control, and determine other inexpensive means of effectively eliminating bacterial growth on produce.

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Adoptive Parent Attitudes Towards Children With Disabilities

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Keywords: Adoption, Adoptive Parents, Disabilities

Abstract

Adoption and child service agencies are overwhelmed with available children, and those with disabilities make up a disproportionate percentage. This non-random pilot study investigated attitudes about the adoption of children with disabilities by surveying 15 parents who had previously adopted a child without a disability. It was hypothesized that adoptive parents would feel the benefits of raising a child with a disability were not worth the emotional, physical, and financial costs. Survey data was statistically analyzed using frequencies, mean comparisons, and a reliability analysis. Results indicated that adoptive parents did feel those benefits were worth the increased costs. Though literature on the topic is sparse, special needs and disabilities were found to be strong factors in adoptive parents' decisions to adopt. Implications for practitioners and future researchers are that education and research needs to be continued in order to serve this overrepresented and underserved group of children.

Introduction

"Adoption is not about finding children for families; it's about finding families for children" (Sclafani, 2004, p. 191). This quote echoes the opinion of many profession-

als who work with children and adoption. According to the Administration for Children & Families (ACF) branch of the United States Department of Health & Human Services (2008), the number children in foster care placement has declined in the past five years while adoption rates have remained constant, showing signs of hope that families for children are indeed being found. However, the ACF study also notes that adoption rates are not nearly adequate to provide for all children. In 2007, there were 51,000 adoptions in contrast to 496,000 children in foster care, a rate of 10.3%. Many studies also show that roughly one-third of all children in foster care have some form of a disability, be it mental or physical. What are the attitudes of society regarding the adoption of children with disabilities, specifically among adoptive parents of children without disabilities? The authors reviewed current literature to view issues regarding the adoption of children with disabilities and determine any stigma that exist. Adoptive parents of children without disabilities were then surveyed to determine their beliefs and attitudes toward children with disabilities that affected or may affect in the future their adoption of a child with a disability.

Literature Review

The main focus of the literature review was the general issue of the adoption of children with disabilities. An absence of contemporary research was noted, as an adequate amount of research from the past ten years was not available. As a result, research from the last fifteen to twenty years was necessary. Also, research emanating from the United States, although present, was not sufficient to provide an adequate background for this subject. Because of this, a study from Canada was included in the review. The breadth of the research focused on the rates of special-needs adoption and

problems that have been found in the adoption process when children with disabilities are the focus.

Egbert and LaMont (2004) examined different factors related to how prepared parents were for adopting a child with special needs. They state that nationally, one in five special needs adoption ends up not being permanent and the child faces yet another placement. Through their research, Egbert and LaMont found that certain factors such as a child's behavioral history, potential parents' experience with children and the level of support from the adoption agency all affect an adoptive parent's preparedness for adopting a child with special needs.

Rosenthal et al. (1991) looked most notably at the outcomes for children with handicaps relating to impact on the family, parent/child relationship, and perceptions of services and supports system through 799 surveys. One hundred sixty three of the returned surveys were from parents who adopted children with handicaps (vision, hearing, or physical impairments, mental retardation, or serious medical conditions). The results showed that there was no difference between the two groups and the impact of the child's handicap on the family. Likewise, there was no significant difference in parent/child relationships between those families with children with handicaps and those families without. Finally, the results showed that parents of children with handicaps rated services available to them less helpful than those parents of children without handicaps.

Westhues and Cohen (1990) found two characteristics relating to the disruption of special needs adoption. They found that families with disrupted adoptions had less positive family functioning and that the father plays an important role in maintaining that placement. Westhues and Cohen also found preliminary results of variables that help predict whether families will be able to sustain the adoption or if it

will be disrupted. These variables are gender-related, noting that men showed differences on affective involvement and expression and women showed differences regarding values and norms. Three demographic variables pertaining to a couple's reason to adopt (number of years married, occupation of the husband, and history of miscarriages) were found to play a role in predicting if a family would have a sustainable or disrupted adoption.

Wimmer and Richardson (1990) focused on studying the need for specialized programs for adoption of children with disabilities. The results of their research showed that through specialized training and recruitment of both workers and potential families, all children examined in this study were adopted to families. The families that adopted these children went through a detailed process that included an intake interview, orientation session, and a home visit to ensure that the placements would be to safe, caring homes. Wimmer and Richardson also documented obstacles that the adoptions faced both from a program standpoint and from an executive standpoint.

Overall, this topic is lacking in current research. Earlier research shows adoption outcomes for children with disabilities to be positive and also shows certain factors that affect the adoptions of these children. The authors hope to narrow the gap in the research and focus on the attitudes of parents who have previously adopted children without disabilities. With this research, the authors hope that professionals in the field of adoption will address these attitudes toward adopting children with disabilities to open people's minds regarding this topic.

Theoretical Framework

This research study was influenced and informed by Social Exchange theory (Strong, DeVault, & Cohen, 2005), which posits that social relationships are formed with individuals acting in their own best interest to gain benefits from the relationship. It also asserts that individuals will only enter and maintain relationships as long as the costs to them are worth the benefits they are receiving.

The Social Exchange theory would predict that the costs of raising a child without disabilities differ from the costs of raising a child with a disability, which can affect potential adoptive parents' attitudes. This theory also predicts that adoptive parents of children without disabilities will have attitudes regarding the adoption of children with disabilities that imply that the workload and costs of raising a child with a disability is far higher than raising a child without a disability.

Purpose Statement

The purpose of this study was to view the attitudes that adoptive parents of children without disabilities hold towards adopting a child with a disability. The sample population for this study was taken from a small Midwestern adoption agency. The authors' primary target for the results of this study are adoption agencies and it is our hope that this information can be utilized to create programs to assist adoptive parents in understanding the reality of adopting children with disabilities in contrast to myths and perceptions. The authors also hoped that this research would benefit those working with adoptions to help them better understand some of the reasons why couples choose not to adopt children with disabilities. The central research question in this study was, "What are the attitudes regarding adoption of children with disabilities amongst adoptive parents without children with

disabilities?" The authors hypothesized that the adoptive parent perspective would be that they do not have the various resources available to them to support a child with a disability. This prediction was based upon the Social Exchange theory, which suggests that the various costs of adopting a child with a disability are not worth the benefits.

Method

Participants

The site of this study was a Midwestern adoption agency. Participants were $N = 15$ parents who have previously adopted a child without a disability. Of the 15 respondents, seven were male, six were female, and two declined a gender label. One parent was between the ages of 26 and 34, five were between the ages of 35 and 43, three were between the ages of 44 and 52, and six were above the age of 53. Two of the survey participants reported personal incomes of less than \$20,000, two reported incomes of \$21,000-\$30,000, one reported an income of \$31,000-\$40,000, four reported an income of \$41,000-\$50,000, two reported incomes of \$51,000-\$60,000; and four reported incomes of \$80,000 or above.

Research Design

The purpose of this survey research was to be able to generalize to a similar, larger population so that some inferences could be made about characteristics, attitudes, or behaviors of that population (Babbie, 1990). From our sample population we wanted to identify current attitudes so that we could generalize the data around a larger population of similar adoptive parents in the Midwestern area. The survey design type is best described as a cross-sectional study design in that it was used to capture knowledge, or attitudes, from a cross section of the population at one point in time.

The data collection was done through mailed surveys. The rationale for using this method was that it was the most efficient method to gather the data from adoptive parents in the Midwestern area due to the fact that we could not see any identifying information. Our population was adoptive parents of the adoption agency, our sample was mothers and fathers who have previously adopted children without a disability. For this study, a disability was defined as "a physical or mental impairment that substantially limits one or more of the major life activities of such individuals, a record of such an impairment, or being regarded as having such an impairment" (Orlin, 1995). The study used a non-random sample utilizing purposive and snowball sampling as the purpose was to gather information directly from the adoptive parents in regards to their experiences and opinions. The ethical protection of human subjects was provided by completing the Human Subjects Institutional Review Board (IRB) training; our study has been approved by the IRB.

Data Collection Instrument

A survey was designed in order to assess the attitudes of adoptive parents regarding the adoption of a child with a disability. The survey included a cover letter with an implied consent which included a description of the study, definition of any terms not commonly known, risks and benefits, time commitment, confidentiality, voluntary participation, and contact information of the research team and the supervisor as well as instructions for completing the survey. Along with two surveys in each mailed packet (one for each parent) there was a disclosure statement that included the time sensitivity of the research project and addressed that participation in the survey would not affect any services received through the Midwestern adoption agency or through the State. Participants were also encouraged to read and detach the implied

consent statement for their own records.

The survey consisted of three demographic questions relating to gender, age, and yearly income. Survey participants were given six closed-ended statements based on a 5-point Likert scale. The Likert scale measured the range of the participants attitudes from one (strongly disagree) to five (strongly agree). Questions were informed by our literature and theory regarding what factors relate to the adoption of a child with a disability.

The survey instrument has both face validity and content validity. The instrument has face validity in that the questions posed are logical to the subject of the research and the question at hand. These questions were influenced by the absence of research literature on the topic of the adoption of children with disabilities, implying that such an instrument would be beneficial to furthering analysis of the subject. This instrument shows content validity by exploring all facets of the attitudes regarding this specialized adoption. These facets include financial, emotional, and knowledge-based investigation. To increase validity, the survey was piloted to two peers of one of the researchers. The feedback from the piloted surveys showed that the survey was understood and ready for distribution.

Procedure

The data collection for this study was done through mailed surveys to potential participants. Surveys were sent out on October 27th, 2008 with an anticipated return of November 8th, 2008. We first contacted the adoption agency because of our purposive sample and the need to contact adoptive parents. After contacting the adoption agency, we set up a meeting with the program supervisor of Special Needs adoptions and explained that we needed surveys to be sent out to parents who adopted a child without a disability. The

supervisor agreed to collaborate with us on this project and came up with 50 families for potential participants. Since we had an inaccessible population, we did not attempt to randomize our sample. Due to confidentiality we were unable to self-administer the surveys and as a result, they were sent through the mail. In each mailing there were two surveys along with the implied consent and the disclosure statement. The envelopes were prepared with return envelopes stamped and addressed to be returned to the adoption agency. Thirty seven prepared envelopes were actually sent out by the agency supervisor. For confidentiality reasons the surveys were taken out of the envelopes, scanned for any identifying information, and kept in a locked office at the adoption agency. The surveys were picked up from the agency on November 11th, 2008 for data analysis.

Data Analysis Plan

The surveys were analyzed and checked for any missing data. Due to missing information, three surveys were excluded from further analysis, leaving fifteen complete surveys. The completed surveys were then coded using acronyms for each variable. The first three questions on the survey were demographic variables: gender, age, and yearly income. Each survey statement was a dependent variable and given an acronym name: if parents felt they had the health coverage available to raise a child with a disability (HCV), if they had sufficient support of a partner (PSP), if they had the financial resources necessary (FNR), if they were aware of the costs and benefits of raising a child with a disability (CBB), if they had the knowledge and ability to access support resources (SPR), and if they had adequate knowledge of disabilities (DKN). To analyze the data, the computer program Statistical Package for the Social Sciences (SPSS) was used. The individual was used as our level of analysis. As no

comparisons were made between groups, our data analysis included frequencies, mean comparisons, and a reliability analysis based on Chronbach's alpha. Significance testing was not performed due to the small and nonrandom pilot study sample.

Results

All of our variables were subjected to frequency distribution analysis. Results indicated that there was no missing data. For variables (DKN) and (CBB), the majority of respondents agreed and/or strongly agreed that they had adequate knowledge of disabilities and were aware of the costs and benefits of raising a child with a disability. For the variables (PSP) and (SPR), respondents agreed and/or strongly agreed that they had sufficient support of a partner and had the knowledge and ability to access support resources. For the variables (FNR) and (HCV), the respondents agreed and/or strongly agreed that they had the financial resources and health coverage available to raise a child with a disability.

Table 1
Frequency Distribution of Survey Items

Survey Item	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree	Total
<i>DKN</i> : I feel knowledgeable about the added factors in raising a child with a disability	0.0%	0.0%	26.7%	46.7%	26.7%	100.0%
<i>PSP</i> : I have the active support of a partner necessary	0.0%	6.7%	6.7%	20.7%	66.7%	100.0%
<i>FNR</i> : I have the financial resources necessary	0.0%	0.0%	26.70%	33.3%	40.0%	100.0%
<i>HCV</i> : I have the comprehensive health coverage necessary	0.0%	0.0%	20.0%	20.0%	60.0%	100.0%
<i>SPR</i> : I have the support resources necessary	0.0%	0.0%	13.3%	13.3%	73.3%	100.0%
<i>CBB</i> : The benefits of raising a child with a disability outweigh the costs and risks involved	0.0%	0.0%	30.0%	33.3%	46.7%	100.0%

Table 2
Descriptive Statistics of Survey Items

Survey Item	Mean	Standard Deviation	Range
<i>DKN</i> : I feel knowledgeable about the added factors in raising a child with a disability	4.00	0.76	2.0
<i>PSP</i> : I have the active support of a partner necessary	4.47	0.92	3.0
<i>FNR</i> : I have the financial resources necessary	4.13	0.83	2.0
<i>HCV</i> : I have the comprehensive health coverage necessary	4.40	0.83	2.0
<i>SPR</i> : I have the support resources necessary	4.60	0.74	2.0
<i>CBB</i> : The benefits of raising a child with a disability outweigh the costs and risks involved	4.27	0.80	2.0

A reliability analysis was run to indicate if our six dependent variables (*DKN*, *PSP*, *FNR*, *HCV*, *SPR*, *CBB*) were a reliable index to measure our major concept, attitudes towards adopting a child with a disability. Cronbach's Alpha is a measure of reliability and in our analysis the Alpha was 0.829. This value indicated that our survey questions were a reliable measure of our major concept. We received qualitative comments at the end of a number of our surveys. These comments will be analyzed and themes determined in our discussion section.

Discussion

Our results suggested that adoptive parents perceived that they do have the various resources to support a child with a disability, which was contrary to our hypothesis. One possible explanation for these results is that our sample was taken from parents who had previously adopted, so they may

have been more accepting and ready because the adoption process was not new to them even though their previously adopted child did not have a disability. Another possible reason for this contrast is that these parents may have looked into adopting a child with a disability when they first adopted a child, a factor that was not considered when formulating the hypothesis. Each dependent variable will be discussed in relation to our literature and/or theoretical framework. Then we will address limitations to the study, implications for practitioners, implications for future research, and concluding comments.

Our respondents reported that they felt knowledgeable about the added factors that are included in raising a child with a disability. This is supported through our literature that shows through specialized training of workers and potential families, children are adopted to competent families (Wimmer & Richardson, 1990). This is also supported through our literature from Egbert and LaMont (2004) which found specific factors that related to how prepared parents are for adopting a child with special needs. The majority of responses from our participants agreed they would have the active support of a partner. This is supported in our literature by Westheus and Cohen (1990) who found that an adoption of a special needs child will have a lower chance of being disrupted when the father is there to play an active role in the family. Our results showed that respondents felt they would have the financial resources and support resources necessary to properly care for a child with a disability, which is contrary to our literature that adoptive parents of children with a handicap rated services less helpful to them and also showed that support from the adoption agency played a factor in how prepared parents were to adopt a child with special needs (Rosenthal et al., 1991; Egbert & LaMont, 2004). Our respondents felt they had adequate healthcare coverage to sup-

port a child with a disability. Various studies have found that over 90% of families caring for a child with special needs experience an added financial burden, and that many of them find it necessary to access resources such as Medicaid and the State Children's Health Insurance Program (SCHIP) (Shattuck, 2008).

The Social Exchange theory suggests that individuals will only enter into and maintain a relationship when the benefits of that relationship outweigh the costs to them (Strong et al., 2005). According to this theory, we predicted that adoptive parents would view the adoption of a child with a disability to have costs that outweigh the benefits, but our last survey statement (which addressed the benefits of raising a child with a disability outweighing the costs and risks) showed the majority of our respondents disagreed with our prediction. We can then see through the Social Exchange theory that the adoptive parents viewed the adoption of a child with a disability to have benefits that would outweigh the costs.

Limitations

One limitation of our research is that we had a small sample size to compare to the larger population of adoptive parents. A second limitation is that there was no significance testing due to a small, nonrandom pilot sample size. We were unable to randomize our sample due to our inaccessible population and the time constraints of the study.

Implications for Practitioners

Our results suggest adoptive parents do perceive that they would have the resources to adopt a child with a disability, so we then must ask ourselves why the numbers are lower for adoptions of children with a disability. We feel this information will be useful for practitioners working

with adoptions by giving them the knowledge that people feel ready to adopt a child with a disability but maybe need that extra confidence to do so. These results also implied that practitioners may be able to better serve their clientele by gaining their own education and experience on the subject of children with disabilities. This information would be beneficial to use in informational meetings dealing with adoption and as information for parents who are looking to adopt. Using this information to help potential parents to understand the reality of adopting a child with a disability in contrast to the perceptions that some may hold would be helpful in efforts to limit disruptions and keep placements permanent.

Implications for Future Research

For future research we recommend use of a larger, random sample to generalize the results to adoptive parents regarding the adoption of a child with a disability. From our research we can see the data supports that adoptive parents perceive they do have enough resources to adopt a child with a disability. Therefore, future research focusing on reasons why adults in our society choose not to adopt a child with disabilities would be appropriate. It should be noted that the sample population for this study was parents who have already adopted a child, and future research that includes potential parents in the sample would be beneficial.

Additionally, future research would be improved by conducting a qualitative study with open-ended questions in order to accurately obtain specific information on adoptive parents' attitudes and their reasoning behind said attitudes. Two respondents provided additional comments regarding ways that the questions could be clarified for future research. One response noted that delineation should be made regarding whether potential parents had these opinions prior to the adoption of their child or after getting information during

the adoption phase, while the other noted that the type of disability that is referred to in the survey may affect the responses.

Conclusion

We, as researchers acknowledge that this study may provide little impact in the field in the view of other professionals. However, our hope is that the gap in research on adoption of children with disabilities will be recognized and more research on all aspects of this topic can be addressed. We also hope that practitioners can use these results to help give adoptive parents the extra knowledge they may need to turn their minds from feeling that they have the knowledge and resources to adopt a child with a disability to actually taking the step in doing so. As more practitioners and researchers recognize and learn about this underserved population, rates of the adoption of children with disabilities may slowly become more comparable to the adoption rates of children without a disability.

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